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TRADE MAGAZINE

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Gulf Agriculture is a publication from Matt Media Intl. Ltd. (UK) and is read by agri professionals, farm managers & owners, landscape consultants, contractors, agri-equipment suppliers, horticultural engineers, greenhouse managers, agronomists, veterinary surgeons, ministries, poultry & dairy breeders, importers, distributors, manufacturers and wholesalers of food and agri inputs.

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Printed and published by
Matt Media© Intl. Ltd.(U.K.) 2023



Cover Photo Courtesy: Signify / Bustanica

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THE GLOBAL VETERINARY MARKET SIZE IS EXPECTED TO REACH USD 114.4 BILLION BY 2028

The veterinary industry is constantly evolving. The global veterinary market size is expected to reach USD 114.4 billion by 2028. As new technologies take shape and innovative treatments are realized, animal care will change too. Eurovets outlines three trends that will shape veterinary industry in 2023.

Technology is gripping all areas of our lives. From Internet of Things to blockchain and artificial intelligence (AI), technology is booming. The veterinary industry has adopted technology to a great extent and in 2023, the industry will rely on tech to play a part in

veterinary care including enhanced practice management software that will include features beyond automated appointment reminders. It will also include smart feeders, online prescription refill requests, wearables for pets and more. Technology will only continue to be an important aspect of the industry and will enhance the segment in 2023.

“Technology is at its best when it brings people and pets together. Super excited to continue having Eurovets play a role in advancing tech solutions for our customers, pet parents and ultimately pets” said Yakub Omarji, the COO of Eurovets.

As humans, the pet food industry is also experiencing a shift – particularly with insect protein and novel protein meals. Studies suggest that

insects are already an emerging trend in sustainable foods for pets.

Research indicates that demand for insect protein as an ingredient in pet food and animal feed could hit half a million metric tons in 2030, up from about 10,000 metric tons currently.

In addition, the nutritional value of insects does not differ from the nutritional value of other meat sources. Insects also scored higher than chicken meal for digestibility. Similarly, insects are packed with vitamins and minerals, which the body can absorb at a faster rate than beef or wheat and have a high content of antioxidants, which help protect the body from cell damage.

Eurovets has recently launched a new line in Calibra pet food with insect protein.

BASF SE AND ITS PARTNERS PUBLISH YEAR SIX IMPACTS FOR ‘PRAGATI’, THE WORLD’S FIRST SUSTAINABLE CASTOR BEAN PROGRAM



BASF and its partners have published the latest results from the Pragati project for sustainable castor

beans. Pragati, the world’s first sustainable castor program was founded in May 2016 by Arkema, BASF SE, Jayant Agro-Organics along with implementation partner Solidaridad.

After six years, the program has had an impressive impact to:

- Over 6,200 farmers have been trained, audited, and certified.
- Over 50,000 tons of certified castor seed have been cultivated.
- Year 6 yield is 22% higher than the yield published by the local government for this region.
- Over 6,000 hectares are now being regularly farmed in accordance with the success sustainable castor code – more than 19,000 hectares cumulatively; Pragati farmers are increasing their

land dedicated to castor farming as it is seen as a profitable crop.

- Approx. 6,300 safety kits and crop protection product boxes have been distributed free of charge.

- Water consumption has been lowered by approximately 30 percent in the demo plots where accurate measurement and control is in place.

- Farmers from more than 80 villages in North Gujarat now participate in the program.

- In 2021, more than 260 individual training sessions were held with farmers.

After the successful implementation in the previous years, the Pragati members are further committed to the world’s first sustainable castor program.

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- ③ KARO type jute clothing

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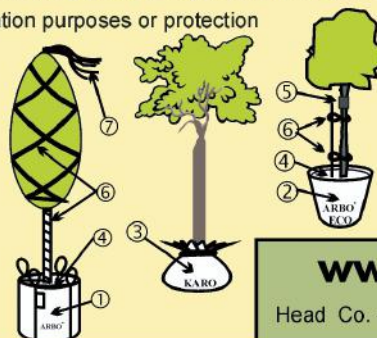
- ⑤ Protection of trunk and grafting points

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Wellness is one important element of the industry. From Hydrotherapy to Class IV laser therapy and acupuncture, pet wellness is a booming market. In 2023, these services will be a gateway for industry practitioners to stay ahead of the curve.

While these are just a few of the trends Eurovets think will shape veterinary medicine in 2023, there are several other components such as pet insurance, tailored blood bank for pets, high tech cancer therapies, MRI/CT's tailored for pets etc... which will also see a rise in demand in 2023.

ICIEC SIGNS COOPERATION MOU WITH AL RAJHI INTERNATIONAL INVESTMENT CO.

The Islamic Corporation for the Insurance of Investment and Export Credit (ICIEC) signed a Memorandum of Understanding (MoU) with Al-Rajhi International Investment Company (RAII) of Saudi Arabia whereby the two parties would cooperate in synergizing coordination, business development and efficient implementation of projects in the vital

agricultural and food security sectors in ICIEC's Member States.

RAII is a subsidiary of Sulaiman Abdulaziz Al-Rajhi Awqaf Holding, which is one of the largest business groups in Saudi Arabia, whose core activities include investments in the agricultural and food security sectors and related fields globally.

The MoU was signed by Mr Oussama A. KAISSI, Chief Executive Officer of ICIEC, and Mr Ahmed Ali Aldakheel, Chief Executive Officer of RAI.

The MoU aims at contributing to achieving food self-

NEW INNOVATION HUB CO-CREATED BY DANA GLOBAL AND AGADIR HORTICULTURAL COMPLEX

DANA Global ('DANA'), the Abu Dhabi-based desert tech venture builder and investment platform, announces its partnership with Agadir Horticultural Complex ('CHA') to jointly establish an innovation hub for resilient and eco-efficient agriculture in the Agadir region.

The new project's official opening and partnership signing ceremony in Agadir, Morocco was attended by over 700 participants. Prominent attendees included Morocco's Minister of Agriculture, Mohamed Sadiki, Piet Adema, Dutch Minister of Agriculture, and Dr Farid Lekjaa, Director of the Agadir Horticultural Complex. DANA was accompanied by a delegation of investors, academics, consultants, and startup founders from the UAE and Israel.

The Agadir region forms the heart of Morocco's agricultural industry and provides 9% of national GDP while processing 90% of the country's fresh produce market - and is perfectly suited to scale up DANA's solutions. The region is also crucial to the government of

Morocco's 'Génération Green' strategy to increase the country's food output.

Shirley Shahar, Co-Founder of DANA Global, commented: "Our partnership with the Agadir Horticultural Centre aims to bring a new innovation hub and centre of excellence to Morocco, and is a huge step for DANA. Two years ago, we decided to establish our base in Abu Dhabi - which has led the way in progressive food security and sustainability policy, and acted as a hub for scaling solutions to the entire MENA region. Complementing our recent partnership with Silal, ADQ's agrifood arm, we want to contribute to a new R&D hub for agrifood solutions hosted by our partners from CHA and the Institute Agronomique et Vétérinaire Hassan II.

"This new project is a milestone in DANA's efforts to scale up

sustainable desert tech solution to the region's largest markets. Agadir specifically harbours huge potential for rapid adoption. The UAE and Morocco are ideal partners to jointly tackle food security, and DANA is proud to play a role in strengthening this cooperation."

Morocco and the UAE share a long heritage of trust and shared values, which provide a solid foundation to cooperate on the pressing issue of food security. The UAE has invested more than US\$20 billion in Moroccan growth sectors over the past four decades.



sufficiency in Saudi Arabia and ICIEC Member States in which RAIL is already engaged, through jointly exploring new agri-business opportunities, investments in agricultural and food security projects, enhancing and developing agricultural infrastructure at the advanced SME and rural farming levels, and co-financing and technical consultancy opportunities with ICIEC clients and partners using the Corporation's risk mitigation and credit enhancement solutions.

The MoU also aims to help boost agricultural production by focusing on developing agriculture technologies and farm management services to maximize productivity. RAIL owns the most extensive organic agriculture project in the Kingdom, one of the largest poultry projects in Saudi Arabia and an integrated poultry project in Egypt. Its products are exported to neighbouring GCC markets, Yemen, China, and Vietnam.

ICIEC and IsDB Group have a focused approach to the agricultural and food industry in the Member States, 36 of which are net food importers. Total IsDB Group's financing support for agriculture and food security currently stands at US\$20.6bn.

Earlier in 2022, the IsDB Group launched a US\$10.54bn comprehensive Food Security Response Programme (FSRP) aimed at supporting Member States in addressing the ongoing food crisis and scaling up the Group's continued efforts to contribute to strengthening its members' resilience to food security shocks in the future. ICIEC supports this "One Group-One Goal" initiative with an

allocation of US\$500m in PRI and credit insurance.

EVENT IN DUBAI REVEALS THE MOST SOUGHT-AFTER EUROPEAN SPICES

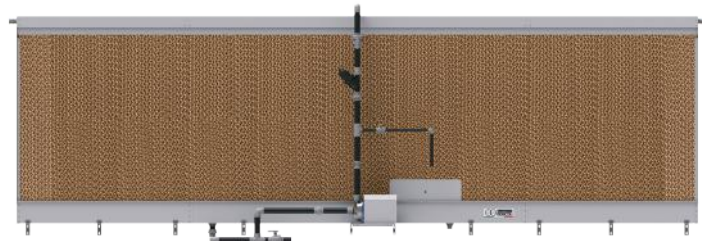
An exclusive product presentation & live cooking Event aiming to showcase the use and benefits of European products, Krokos Kozanis PDO and Magiun de prune Topoloveni PGI - two of the

most sought-after European spices, took place at International Centre for Culinary Arts - ICCA Dubai (Block 8 - King Salman Bin Abdulaziz Al Saud St - Al Sufouh - Dubai Knowledge Park – Dubai) on 7 December 2022, at 15.30 pm.

During the event the participants had the opportunity to learn more about the delicious Krokos Kozanis PDO and the Magiun de Prune Topoloveni PGI and



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taste delicious plates base on these products to make them discover their unique flavors and superior quality.

The EU Financed campaign Discover European Treasures promotes the superior quality Krokos Kozanis PDO from Greece and the delicious Magiun de Prune Topoloveni PGI to consumers in Dubai and Vietnam.

Krokos Kozanis PDO is the world's most expensive spice, is the dried red stigmas of the autumn-flowering crocus. It is known for its properties as a dye as for its unique and distinctively pungent, honey-like flavor and aroma.

Magiun de prune Topoloveni

PGI is a concentrated paste made of fresh, homogeneous, viscous, easily spreadable plums, which is used in the diet of people of all ages - from the age of six months when the diet diversification begins), to diabetics, because has a low glycemic index (on the recommendation of the attending physician).

EVONIK AND DR. ECKEL TO COOPERATE ON PHYTOGENICS

Evonik and Dr. Eckel Animal Nutrition have entered into a partnership effective January 1, 2023. This agreement will enable Evonik's Animal

Nutrition business line to expand its product portfolio in the Gut Health Solutions area to include the phytochemicals product class. Evonik plans to launch a first product from the partnership with Dr. Eckel in Europe in the first quarter of 2023.

Phytochemicals are plant-based feed ingredients which play an important role in alternative solutions to antibiotic use in livestock farming. The use of antibiotic growth promoters in animal feed has been banned in the European Union since 2006.

"It often needs complex solutions to maintain health and productivity in the barn

BUSTANICA, THE WORLD'S LARGEST VERTICAL FARM PRODUCES OVER 1 MILLION LEAFY GREENS ANNUALLY WITH PHILIPS GREENPOWER LED

In a harsh desert climate, conditions are very severe to grow leafy greens locally, and transporting the vegetables is not sustainable. Located next to Dubai airport, Bustanica produced more than 1 million leafy greens annually. Bustanica is the biggest vertical farming facility in the world with a 3 Ha area and 27 rooms with individual climates to control the production of leafy green fully. The results: the cleanest, hygienic, and most sustainable leafy greens. "The objective of the farm is to make sure we have the cleanest and most hygienic product in a sustainable way to serve on emirates flights," Kieran Dowd, Vice President of Sourcing Solutions Emirates flight catering.

Lighting is essential at Bustanica vertical farming facility. The unique light recipe helps leafy greens to grow stronger and healthier.



Philips LED has the best light efficacy with the minimum number of LEDs required to achieve the best results in the Bustanica vertical farming facility. Customers highly appreciate the taste and the freshness of the leafy greens, but more importantly, the cleanliness and hygiene of the products. Leafy

greens from Bustanica are the first product from UAE where customers can eat the products directly from the bag without the need to wash them. Bustanica works closely with Philips horticulture for continuous improvement to deliver sustainable, high-quality products.

without antibiotics," says Gaetano Blanda, head of the Animal Nutrition business line at Evonik. "In combination with our existing Gut Health Solutions, phytogenics will help farmers achieve this goal."

Evonik Gut Health Solutions focus primarily on stabilizing the gut health of animals through probiotics such as Ecobiol®, Fecinor®, and GutCare®. The partnership with Dr. Eckel, one of the most experienced and innovative suppliers in the field of phytogenics, will allow Evonik to address further animal health issues with selected products that expand Evonik's portfolio.

Customized System Solutions consisting of several components and delivering sustainability benefits are part of the strategic core of Evonik's life science division Nutrition & Care, which includes the Animal Nutrition business line. With its products, services and knowhow, Evonik aims to help supply a growing world population with healthy animal protein in an efficient and sustainable way.

"As a dynamic company with a high pace in product development, we are able to create innovations in a comparatively short period of time," says Dr. Antje Eckel, founder of Dr. Eckel Animal Nutrition. "With a strong partner like Evonik, we

can allow selected products to access a much wider market in a short time. We are therefore very happy that together with Evonik we can open up new target groups and customers."

Dr. Eckel Animal Nutrition is a family-run company with international operations. A broad knowledge of plant substances and their interactions as well as experience from almost three decades of work with innovative feeding solutions allows the company to develop phytogenics with specific benefits.

IFARM JOINS GLOBAL TECH COMMUNITY HUB71 IN UAE

The leading innovation ecosystem of the Gulf region Hub71 selected iFarm to join their incentive program to develop vertical farming technologies in the area.

Hub71 is the largest global tech ecosystem of the Gulf region, including more than 200 technology companies. Hub71 is a flagship initiative of the "Ghadan 21" economic accelerator program led by Mubadala Investment Company and backed by the Government of Abu Dhabi.

The Hub71 selection committee identified iFarm's great potential, and soon the company will join the Hub71 educational program as well as get financial support to set up an office and R&D facilities.

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“We are getting closer to our customers in UAE, Saudi Arabia and other MENA countries, enabling vertical farming businesses with iFarm's turnkey solutions for entrepreneurs and corporations. In the region, 3 vertical farms with iFarm technologies are already under construction, and with the support of HUB71 network we will establish new jobs to scale up in the region”, says Maxim Chizhov, iFarm Co-founder and CBDO.

Industrial vertical farms based on iFarm technologies are already under construction: Bather Farms in Al-Riyadh

(Saudi Arabia) and Green Farm in Dubai (UAE). A farm in Qatar is at design stage.

AGRANA DEFINES ITS OWN SCIENCE-BASED CLIMATE TARGETS

AGRANA Beteiligungs-AG has submitted its targets for reducing greenhouse gas emissions to the NGO Science Based Targets Initiative for verification purposes. The aim here is to determine whether the Group's objectives to reduce emissions by 2030 are aligned with those of the Paris Climate Agreement. AGRANA

joined the Science Based Targets Initiative (SBTi) in July 2021. The SBTi unites companies which commit to emission-reducing targets that are consistent with the Paris Climate Agreement.

“These science-based targets are our commitment to further decarbonisation. Our firm intention is to reduce greenhouse gas emissions by more than 30 percent along our entire value-added chain (Scope 1 + 2 + 3) and to cut emissions from our own production activities (Scope 1 + 2) by more than half. By 2040, we will reduce our own

ELITE AGRO DOUBLES PRODUCTION AREA OF UAE-GROWN BLUEBERRIES FOR THE NEW SEASON



Elite Agro (EAG), a leading UAE producer and distributor of fresh produce, has doubled the production area of its blueberries, expanding the harvest season this year and adding new varieties of the popular superfood.

Elite Agro's premium brand of 'Elite Berry' blueberries are bringing locally-grown blueberries back to the market fresh from its Al Foah Farm with three new varieties, exclusive to the region. In addition to the famous jumbo blueberry named "Eureka", the farm is growing variants called Eureka Sunrise, Dazzle, and

hectares at Al Foah farm, encompassing 40 greenhouses and more than doubling the previous area of 12 hectares. Each greenhouse nurtures 3,350 blueberry plants that thrive in a climate-controlled environment enabled by advanced technologies.

“By planting new varieties of blueberries that are partnered with sustainable farming techniques, we continue to build on our success of supplying locally produced blueberries to UAE consumers, in line with our ambitions to support food security

Masena to help diversify and lengthen the harvest season to run from the end of December until June.

This year, blueberries will be grown over an area of 25.8

through sustainable farming,” said Dr Abdulmonem Almarzooqi, CEO and Managing Director at Elite Agro Holding.

Blueberries were first planted in 2017 at Elite Agro's Al Foah Farm to supply the local market with high-quality locally-grown produce that exponentially reduces the farm-to-shelf time, retaining flavour and freshness. By expanding the harvest season, Elite Agro will be able to supply locally-grown blueberries to UAE retailers for almost eight months of the year, which will help to further reduce the carbon footprint created by blueberry imports.

The company has seen consecutive successful years of harvests, increasing its output earlier this year to 280 tons of blueberries, compared to 210 tons in 2021. In the new season, it expects to increase production to more than 400 tons, ensuring consumers can obtain the freshest locally-grown high-quality blueberries for longer.

emissions to a net zero and, by no later than 2050, we are committed to net zero emissions along our entire value-added chain," emphasises AGRANA Board Member Norbert Harringer.

Due to its proximity to the source of agricultural products, sustainability has always formed an integral element of AGRANA's corporate philosophy. Previously an issue addressed by the entire Management Board, sustainability has now been defined as a separate area of responsibility at the management board level due to the rising environmental challenges AGRANA faces. Besides sustainability, Harringer is also responsible for the areas of production, investments, raw material procurement, quality management and R&D.

In order to define its climate targets, AGRANA has now for the first time calculated greenhouse gas emissions along the entire value-added chains (Scope 1 + 2 + 3) of each of its three business segments (Fruit, Starch and Sugar) given its role as an energy-intensive processor of agricultural raw materials. The major challenge which AGRANA has set itself as one of the first in the industry is estimating emissions from farming the agricultural products its processes due to the lack of supplier data. Its 2019|20 financial year was defined as the baseline for calculations. In total, AGRANA's business activities accounted for around 5.1 million tonnes of CO_{2e} over this period. The majority of this (around 80 %) originates from the upstream value-added chain (Scope 3) or, more precisely, from the growing of agricultural raw materials (again around 80 %). In order to reduce these emissions, AGRANA will be focussing on land use for agricultural production and on the impacts of agricultural growing methods. The aim is to collaborate with AGRANA's suppliers and agricultural partners

to develop and implement specific climate-related reduction targets by 2030.

TURNING POTATO CHIPS CLIMATE FRIENDLY IN ARGENTINA

Yara has signed a memorandum of understanding with El Parque Papas to deliver fossil free green fertilizers to the biggest potato farmer in Argentina.

This marks an important step towards making one of the most popular snacks in the country climate friendly.

El Parque Papas is the biggest singular potato farmer in Argentina. Led by Walter Hernández, they supply 14,000 metric tons of potatoes every year to the Argentinian potato industry, including production of some of the most popular chips in the country.

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fertilizers Yara will start producing will significantly reduce the carbon footprint of farming and food because they will be made with renewable electricity instead of natural gas. Using Yara's green fertilizers for potato production will remove around 28.8 percent of greenhouse gas emissions at the farm level. For potato chips specifically, using green fertilizer will reduce the carbon footprint by around 5-10 percent.

"Most people probably don't think about emissions when eating their chips. But there are huge opportunities to decarbonize snacks, if we find business models that enable

each step of the value chain to contribute and to benefit. This is why the agreement between Yara and El Parque Papas is important, we show that this can be done," says Svein Tore Holsether, CEO of Yara.

K-RAIN MANUFACTURING ANNOUNCES NEW PRO-LC WIFI-READY IRRIGATION CONTROLLER

K-Rain Manufacturing announces the release of their PRO-LC WiFi-Ready Irrigation Controller.

"The PRO-LC controller has been extremely popular since

its introduction because it is so feature-packed and price-friendly," says Josh Carmichael, K-Rain Engineering Manager. "And the new news is that we've now added Wi-Fi capability so it can be controlled by a smartphone or tablet.

"It's all very exciting to see how the market is responding to the WiFi-Ready product," remarks Greg Dougherty, Sales Director North America. "Users love the convenience and ease of operation. Just insert the optional BRIDGE Wi-Fi module, download the app and begin controlling from your phone."

The PRO-LC WiFi-Ready controller has all the advanced

ORDER SIGNED WITH A LARGE POULTRY PRODUCER

MTech Systems, a Munters company within business area FoodTech, secures an important Software-as-a-Service (SaaS) contract with one of North America's largest poultry producers. The order has a value of MUSD 4.3 (approximately MSEK 46).

MTech Systems will deploy the Amino platform, its newest and most innovative SaaS solution. The contract represents the

establishment of a long-term partnership to enable the poultry producer to better control and analyze their full value chain including breeding, hatching, feeding and growing.

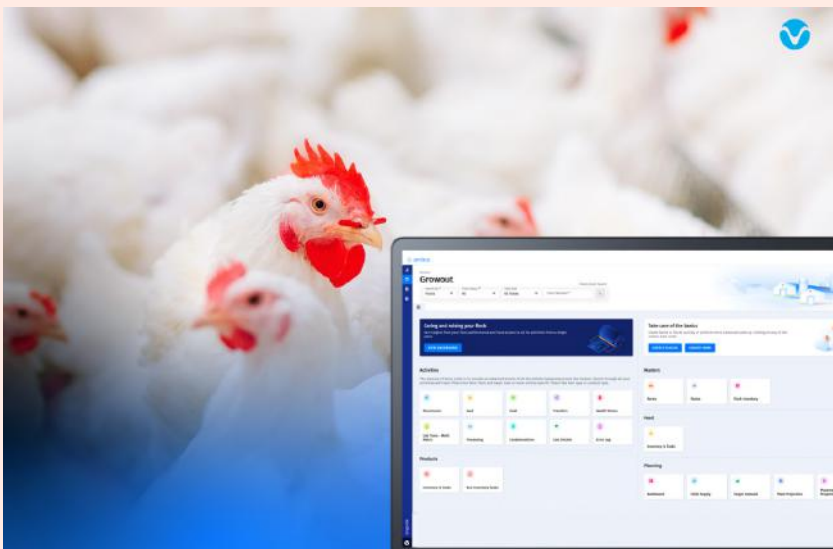
"This vital partnership continues the successful execution of our strategy focused on helping feed our growing world population. I am excited by the number of top producers that commit to our vision

for monitoring and optimizing the entire food value chain to improve sustainability and animal welfare," says Pia Brantgärde Linder, Group Vice President and President FoodTech.

This agreement demonstrates the recognition of MTech System's products and services value within the industry. The software solutions and consulting effort will result in a consolidation and standardization of the producer's many food production complexes across the US.

"I am energized to add this important poultry producer to our significant North American client base, solidifying our role as the number one software solution provider for the industry. We look forward to further innovation and progression toward our common goals of sustainable and responsible food production," says Marcel Cohen, President of MTech Systems.

The project will commence in second quarter of 2023 with completion of all sites by second quarter 2024.





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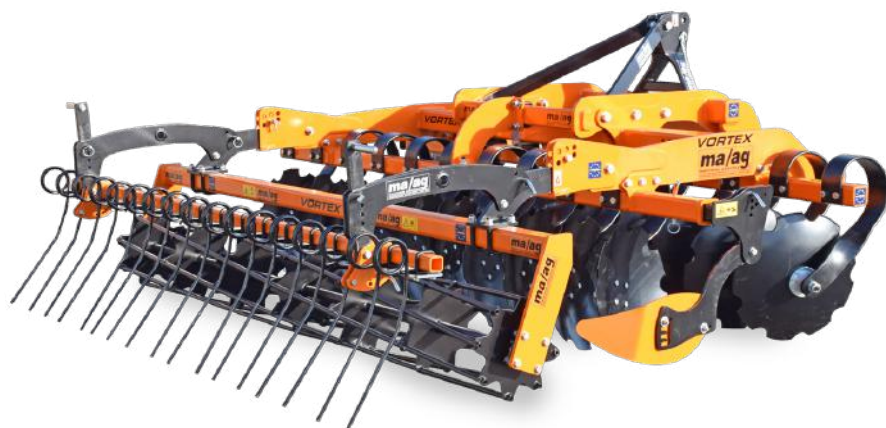
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features of pricier controllers including full program display, seasonal adjust, buried valve locator and is rain/freeze sensor ready.

OVER 35 SHOWCO MEMBERS READY FOR VIV ASIA 2023

Over 35 companies from the ShowCo Association will attend VIV ASIA in March (8 – 10). The association brings together leading companies that supply key products and services to poultry producers.

In ShowCo, member companies co-operate to

improve the quality of poultry trade fairs and deliver better events for both exhibitors and delegates. ShowCo members do not attend every event. They target the best poultry trade fairs which attract high-quality visitors. Also, they only attend each event bi-annually, giving them more time to work on innovations.

ShowCo members will ensure it is worth visiting their stands at VIV Asia. Visitors will come away with new ideas and new contacts to boost the performance of their poultry business.

ICL'S LATEST SUSTAINABLE INNOVATION FOR CONTROLLED RELEASE FERTILIZERS

Controlled release fertilizers (CRF) improve the nutrient use efficiency of plants, reduce nutrient loss, and simplify fertilizer application. CRFs contain plant nutrients in a form that can't be readily absorbed by the plant, so uptake is delayed after application. CRFs can be applied a single time, and provide nutrients to the plant throughout the entire lifecycle.

MINISTER OF ECONOMY VISITS DIBBA BAY OYSTER FARM TO REVIEW PLANS FOR GLOBAL TRADE PROSPECTS AND EXPERIENCE IN UTILISING INNOVATION IN STARTUPS

H.E. Abdulla Bin Touq Al Marri, Minister of Economy, visited the Dibba Bay Oyster farm in Fujairah, renowned for producing oysters of the highest quality in the UAE. This was a part of the Economic Communication series of visits made by H.E. to the leading projects across all the Emirates to build effective relationships with the business community and offer incentives needed for sustainable growth and prosperity as they are key allies in advancing the UAE's new economic model in line with the objectives and 'the principles of the 50' and the cornerstones of the UAE Centennial 2071.

HE said: "In addition to reviewing successful experiences in establishing businesses, discussing growth plans, opening up new global trade opportunities in the upcoming period, and reviewing perspectives on economic development efforts, we are committed to communicating with the leading companies in the

nation. This will allow us to measure the effects of the legislation and initiatives launched by the government on the growth of their commercial activities. Furthermore, this will assist in initiating proactive projects that advance the UAE's economic model, boost sustainable development, and enhance competitiveness of national projects, while satisfying investor desires."

H.E. met with the farm supervisors to learn more about their plans for future investments. He further discussed strategies to expand the business model in the UAE and encouraged Emirati entrepreneurs to launch ventures based on cutting-edge technologies and innovation, as they support domestic production and are in line with the government's policies to increase exports, attract talent,



achieve food security, and advance sustainable development goals.

The Dibba Bay Oyster Farm is a significant innovative project for the oyster industry in the UAE. Founded in 2016, the farm comprises 18 hectares of marine concessions, supporting national goals for local and global edible oyster production. The farm cultivates between 300,000 and 400,000 oysters every month, exporting 50 per cent of its production to Hong Kong, the Maldives, Mauritius, and the Seychelles. In the near future, it plans to expand into the markets of China and other Asian nations.

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CRFs are coated fertilizers where the coating material controls the rate, pattern, and timing of the nutrient release. The best controlled release fertilizers are designed to synchronize with changing crop nutrient requirements throughout the growth cycle.

CRFs release nutrients through a three-stage process. First, water penetrates the coating. Then, the nutrients dissolve, and finally, the nutrients are released through the CRF system.

There are different types of controlled release fertilizers, though most use polymer coatings made of thermoplastics, resins, or natural coatings. Some use inorganic materials like minerals and clay. ICL's Osmocote, first introduced over 50 years ago, is one of

the best controlled release fertilizers on the market today.

Controlled release fertilizers have been in the market for some time, though farmers and crop advisors have been learning more about what controlled release fertilizers are over time. As of May 2022, the controlled release fertilizer market is projected to reach \$4895.6 million by 2030.

Controlled release fertilizers have a market in many crop types. Cereals and grains, oilseeds and pulses, and fruits and vegetables can all benefit from CRF. Newly planted orchards and vineyards as well as new forestry and oil palm plantations are uses for CRF. Not only agricultural crops but also turf and ornamentals have a market for CRF! CRFs have the potential to make a global impact on sustainability.

SPOTLIGHTS 2023: DISCOVER THE NOVELTIES AT FRUIT LOGISTICA

FRUIT LOGISTICA is the ideal platform for the fruit trade to present its innovations. Be it new fruit and vegetable varieties, sustainable packaging, data-driven monitoring of production or pest-resistant crop strains, from 8 to 10 February 2023 in Berlin trade visitors can find out about numerous innovations.

In the run-up to the trade show, trade visitors and media representatives can gain an overview of the solutions that exhibitors at FRUIT LOGISTICA have in store to meet the current global challenges such as climate change and resource

17TH INTERNATIONAL CROP-SCIENCE CONFERENCE & EXHIBITION, INDIA'S BIGGEST AGRI INPUTS TRADE SHOW TO BE ORGANIZED ON 16 & 17 FEBRUARY 2023, DUBAI

ICSCE is a biggest and only Agri Input (includes, Fungicides, Herbicides, Insecticides, pesticide, Agrochemicals and their raw materials, API and intermediate (solvents, Surfactants, intermediates etc.), fertilizer, agrochemical packaging, seeds, show organized in Dubai which provides an opportunity to meet Distributors, Suppliers, R&D Executives, Technical Executives, Manufacturers, Consultants, Exporters, Importers, Agronomists, Research Institutions, Scientists, Traders, Journalists, Supply chain management & co-operatives, Ventures capitalists & Financial Representatives, Service providers, Farmers & dealers, Allied Chemicals & Packaging material suppliers, Seed companies,

spraying and irrigation equipment manufacturers, plantation and horticultural producers, Manufacturers & Distributors of Bio-pesticides, Bio-fertilizers, Micronutrients, Key Government officials, Policy Makers & Researchers, Industry Associations, Chamber of Commerce etc. all those involved directly & indirectly with agri inputs. Attend knowledge-oriented conference session and Gain extensive knowledge in workshop. The event will have concurrent PMFAI- SML Annual Agchem Awards ceremony at the gala night, witness the ceremony to know emerging global leaders from India.

The previous ICSCE events witnessed participation various countries included – Australia,

Argentina, Abidan, Afghanistan, Brazil, Belgium, Bangladesh, China, Chile, Columbia, Charlotte, Egypt, Ethiopia, Europe, France, Germany, India, Indonesia, Iran, Italy, Jordan, Korea, Kenya, Kuwait, Malawi, Morocco, Nigeria, Netherlands, Norway, Palestine, Philippines, Russia, Saudi Arabia, South Africa, Sri Lanka, Switzerland, Syria, Singapore, Sweden, Taiwan, Thailand, Tanzania, U.S.A., United Arab Emirates (UAE) and Vietnam.

The ICSCE provides great Opportunity to stand distinguished amongst more than 1000 delegates to promote the business, and you may choose from various types of Sponsorship's and exhibiting opportunities. Position yourself and stand out from others.

SYNGENTA LAUNCHES WORLD'S FIRST COMMERCIAL DIGITAL TOOL TO DETECT HARMFUL NEMATODES THROUGH SATELLITE IMAGES

Harmful nematodes that feed on roots of plants can cause major damage to crops, causing billions of dollars in damage. Syngenta Crop Protection, a global leader in agricultural innovation, is launching the world's first commercial digital solution to diagnose infestations of plant-parasitic nematodes in soybean crops by analyzing photographs taken from satellites. This marks a breakthrough in the management of this devastating pest and is a product of Syngenta's focus on delivering an expanding portfolio of digital and precision agriculture solutions to farmers worldwide.

Plant-parasitic nematodes are microscopic parasites living in the soil that feed on plant roots, opening pathways to further fungal infections and threatening plant health, crop quality and yield. These harmful nematodes account for as much as USD 150 billion in crop

losses globally each year.

The new digital tool uses a unique, proprietary algorithm to analyze images of fields obtained by satellites, allowing it to identify areas of high infestations of plant-parasitic nematodes in crops and estimate potential losses caused by these microscopic parasites. Using the tool, farmers can make quick adjustments to their field management practices, helping them avoid losses in yield, as well as optimizing the use of inputs, improving the sustainability of their farms.

Syngenta will first market this service to soybean farmers in Brazil, where the company already offers an extensive range of advanced digital solutions. Soybean is one of the most important crops in the world for its vital role in food production, and Brazil accounts for



approximately 35 percent of global soybean production. In Brazil, plant-parasitic nematodes cause estimated losses in soybean production amounting to more than USD 5.4 billion a year. So far, the threat from harmful nematodes has been largely invisible and insufficiently understood, and estimates say that Brazilian farmers lose as much as 30 percent of their yield in highly infested areas.

shortages. In the Spotlights, the leading trade show for the global fresh produce business presents a selection of more than 30 innovations, many of them making their debut on the world stage.

Innovative packaging methods for example are promoting sustainability. Carton Pack has designed a practical bucket made from Social Plastic® rPET, i.e. plastics recovered from ocean waste. This reduces environmental pollution and benefits the livelihoods of those collecting it. The programme behind the effort provides care and education. Inkarta by contrast uses paper for its packaging which

is made from renewable raw materials and is fully recyclable.

The Dutch company Hotraco with its iHotraco Storage Data solution, for example, is showing how precise data can make production more efficient. This system makes crop storage easier for producers and provides a constant overview of data. Delphy Digital's quality management systems also support crop production, by helping to make greenhouse cultivation more efficient. DeltaTRAK users log data on fresh produce in real time while it is in transit to the customer. With its FlashTrak

Cloud Services, DeltaTRAK offers global supply chain actors a turnkey solution with a data-driven decision-making capability. Technical innovations such as these are helping to effectively reduce food waste.

CERSA AND WPSA CO-ORGANIZE THE SECOND PAN-AFRICAN POULTRY CONFERENCE

The Regional Center of Excellence for Poultry Science (CERSA), University of Lome, and World Poultry Science Association (WPSA-Togo branch) co-organize the second edition of the Pan-African

Poultry Conference (PPC) from the 16th to 18th of May, 2023.

Conference theme: "Competitiveness and inclusiveness of the value chains of the poultry sector in Africa".

This conference aims to bring together specialists, industrialists, trainers, and researchers in the field of poultry from various backgrounds to discuss the challenges of poultry production in Africa.

This meeting of international scope which is a melting pot, a place of exchange and reflection on the poultry sector, is supposed to bring together more than 300 participants and actors in the poultry sector

from many countries in Africa and beyond.

Five (05) main themes will be discussed during the PPC 2023, namely:

- Environment and poultry production systems;
- Diet, nutrition & metabolism;
- Reproduction and incubation;
- Product quality, processing and food safety;
- Economics of poultry production.

SINOKROT IN JORDAN MAKES SMART INVESTMENT

Jordan-based Sinokrot Poultry Farms is a specialist poultry farming and production

business and part of the large and regionally important, family-owned enterprise Sinokrot Group – a vertically integrated poultry company with 14 farms across the country.

Sinokrot's hatchery has a total annual capacity of 24 million broiler hatching eggs and three-million layer hatching eggs. An additional hatchery in the Palestinian territory has the capacity to hatch a further 15 million eggs per year.

As part of a major hatchery expansion programme, Sinokrot has invested in Royal Pas Reform's SmartPro™ integrated technologies. The new hatchery will take full

MANSOUR BIN ZAYED ISSUES RESOLUTION TO STRENGTHEN ABU DHABI'S AGRICULTURAL LEGISLATIVE SYSTEM

His Highness Sheikh Mansour bin Zayed Al Nahyan, Deputy Prime Minister, Minister of the Presidential Court, and Chairman of the Board of Directors of Abu Dhabi Agriculture and Food Safety Authority (ADAFSA), has issued Resolution No. 2 – 2022 to enhance the quality of agriculture and food facilities by further strengthening the emirate's agricultural legislative system.

The requirements enable the issuance of administrative penalties against agriculture and food facilities to ensure high-quality standards across the emirate.

The resolution represents ADAFSA's achievements in applying governing standards and ensuring adherence to all procedures, and administration of penalties against violators, to reach the highest compliance rates for its legislations.

With this resolution, ADAFSA

supports the sustainability of agriculture, promotes biosecurity, and reduces improper practices on farms, livestock holdings (izba), and food production facilities.

His Excellency Saeed Al Bahri Al Ameri, Director General of ADAFSA, expressed his gratitude to His Highness Mansour bin Zayed for his support of the authority's efforts in developing a sustainable agricultural sector, as well as strengthening the food security and biosecurity system in Abu Dhabi.

His Excellency assured that the resolution would allow the authority to enhance field inspection visits at all the food processing stages from



the farm to fork. Aside from monitoring and inspecting agricultural facilities in both farms and livestock holdings (izba) in Abu Dhabi. The resolution will allow the appeal of administrative penalties within 60 days of the date of notifying the complainant, and failure to respond within 90 days of its submission is considered acceptance of the complaint.

advantage of Pas Reform's position as a single-source, fully integrated supplier of incubation, climate control and hatchery automation. The installation includes 18 SmartSetPro™ setters, incorporating modular design and Pas Reform's Vortex™ based airflow principle; Adaptive Metabolic Feedback™ (AMF™), and the Energy Saving Module™ (ESM™).

The setters will be complemented by 10 SmartHatchPro™ hatchers, each equipped with SmartWatch™ – which by CO₂-sensitive automation monitors and adjusts the hatching process to optimize the hatch window for every cycle. Hatchery operations will be fully supported by Pas Reform's SmartCenterPro™ hatchery management system, to ensure precise, consistent process control.

Founded in 1984 by one of the oldest and most famous and prestigious Palestinian families from Hebron, the Sinokrot Group, led by owner and Managing Director, Hani Sinokrot, is the exclusive agent for Novogen breeder layers in Jordan and an important producer of table eggs in the country, with the capacity to produce 150 million annually under the brand name Taza. It is also one of the most important exporters of hatching and table eggs, exporting its products to the neighbouring countries in the Gulf region.

R2000FX TAKES HOME THE SILVER AWARD AT THE IA SHOW

The R2000FX Rotator® turned some heads at the Irrigation

Show 2022. It was awarded Silver for the IA New Product Contest Award for Agricultural Irrigation. The R2000FX combines Nelson Irrigation's proven Rotator® Technology with off-axis plate motion to deliver low-pressure operation with unparalleled radius of throw of 33-40 feet (10-12m).

NOVUS ACQUIRES BIOTECH COMPANY AGRVIDA TO DEVELOP NEW FEED ADDITIVES

Global animal health and nutrition company Novus International, Inc., announced its acquisition of biotech company Agrivida Inc. Through the purchase, Novus takes ownership of the proprietary INTERIUS™ technology Agrivida developed to embed feed additives inside grain. This move by Novus comes two years after it began a commercial partnership with Agrivida to support the sale of the start-up's flagship product, GRAINZYME®.

"Since December 2020, we've taken the time to understand and explore what INTERIUS™ technology is capable of," says Novus President and CEO Dan Meagher. "With this technology we believe we can revolutionize the feed additive industry through the expression of high-value, functional proteins inside grain, providing new products that are sustainable, both environmentally and operationally."

While the category of functional proteins includes enzymes, which Agrivida has already accomplished through GRAINZYME®, the Novus Innovation team is expanding

the product offerings to include antibodies embedded in grain.

"Single-domain antibodies present an opportunity to naturally address the health challenges producers face in antibiotic-reduced and antibiotic-free production. These antibodies are a challenge to produce cost-effectively and deliver to the animal in a sustainable way," says Novus Vice President and Chief Innovation Officer Al Zimmerman. "INTERIUS™ technology addresses these challenges by removing costly fermentation and coating processes as well as offers the potential to stack different antibodies and/or enzymes in a single corn product solution for the animal. Traditionally these efforts would require blended products, which would mean more processing and cost. The INTERIUS™ technology delivers this benefit in a single ingredient - corn."

Instead of manufacturing feed additives by fermentation, INTERIUS™ technology tells the grain how to make the additive directly in the grain. The grain is grown, harvested and ground, and fed to the animal like any other corn in diet. Zimmerman says by having the additive inside the grain, the molecules are more efficiently absorbed by the animal, allowing producers to improve both performance and their return on investment.

The acquisition includes Agrivida, Inc., and its operations in Massachusetts and Nebraska. The Agrivida team, including founders R. Michael Raab and Jeremy Schley-Johnson, will join Novus bringing with them their innovative approach to developing functional proteins.

LEADERS IN AGRICULTURE RETAIL AND LANDSCAPING



Shaheen M. AlRubaie
General Manager



Established in 1985, AlShaheen Nurseries has been ever since developing itself as one of the leaders in the field of agriculture retail and landscaping. AlShaheen Nurseries provides a complete set of agriculture and gardening services. The team is run by well qualified engineers and experienced supervisors, with a long and successful track record in agriculture projects execution. The company is located in Shuwaikh, 4th Ring Road, Nurseries Area. It's our pleasure to introduce our wide range of services we offer the following:

- Landscaping and planting

division for indoor and outdoor gardens. Wholesale division (For Agricultural Companies only).

- Maintenance team for agricultural projects and house gardens.
- Designing and implementing irrigation systems.
- Wide range of indoor and outdoor plants.
- Wide range of flower and vegetable seeds.
- Different sizes and colors of plastic net shades.
- All kinds of natural and chemical fertilizers.
- Peat Moss, potting soil, hydroton.
- Agent and distributor of indoor and outdoor pots of different shapes and sizes.



AlShaheen Nurseries showroom is considered as a garden center for selling indoor and outdoor plants – Grass – Peat Moss – Potting Soil – Plastic Net Shades – Pots – Rocks – Seeds – Natural and Chemical Fertilizers – Agrilite – Irrigation Sys. – Water pumps – Insect



killer – Hydroton – Palm bags.
The Company aims to provide many items to serve different customer's tastes, in addition to provide the best quality and less prices under one roof.

AlShaheen Nurseries owns a farm in Wafra area specialized in growing plants, flowers, and paspalum grass, runs by well qualified engineers to provide the market and the agricultural companies with the best varieties and quality. The farm is considered one of leading farms in Wafra in growing plants, flowers, and paspalum grass.

The Project Division is run by well qualified team of engineers

and supervisors to design landscape and maintain gardens. There is a team for designing & implementing irrigation systems.

The wholesale division was established in 2000 to provide

the Ministries and the agricultural companies with plants, garden tools and irrigation systems. Since then, the division has been supplying some of the leading government and private projects.





ANCIENT AGRICULTURE THRIVING IN MODERN TIMES

Written By

Rick Pares

Director
Wangara Horticultural
Supplies

Figs, the first cultivated plants by humans

Archaeologists have found subfossil figs, in the Jordan Valley, dating back to over 11,000 years ago. This finding strongly suggests that fig

trees were the first proof of agriculture and occurred at least 1000 years before traditional crops like wheat were planted.

The Fig Tree is strictly native to the Middle East and its popularity and health benefits saw it transplanted by the Greeks and the Romans throughout Europe and in the 15th century to the Americas. The first Olympians consumed the nutritious fruit and were also presented with figs as medals.

It isn't surprising that Figs are mentioned in ancient texts and hold a position of symbolism in many world religions representing fertility, peace and prosperity. They have been a culinary delicacy throughout time. These versatile "fruits" are not actually a traditional fruit, but rather a syconium with hundreds of inverted flowers each bearing a single seed in each sac.

Fig Tree Production in Modern Times

Today, producers world-wide see the fig tree as an alternative crop with a bright future. The experience of this visionary Chilean farmer Martin Wielandt, from Doble Valle, is a modern example of

its cultivation merits. In an interview for El Agro on Radio Agriculture on January 4, 2020, he explains how he started with a small fig orchard in 2012, and now has a 21-hectare plot and more than 6,500 trees planted.

"In general, it is a simple plantation, it does not require great care and the trees are quite robust. On the other hand, it presents some challenges during harvest, as it lasts for 10 weeks, since the fruit matures in layers. This is a fundamental difference compared to other fruits. There are 670 plants per hectare and more specifically actual "flowering" trees, there are



Rustaq Flower nursery in Muscat, Oman



Cardboard palms growing in 75 litre Easy-Fill™ Grow Bags - Oman





Fig trees growing in 100 litre Easy-Fill™ Grow Bags

fewer plants, approximately 500. A good harvest is between 8,000 and 10,000 kilos per hectare”.

Less water consumption and greater production

The new climate scenario has caused agricultural producers to consider fruit trees that are more resistant to heat, and that have less water consumption. In this context, the fig is a fruit that does not require great amounts of water compared to other similar crops, in addition, its production level is usually very high, obtaining better results per square meter of planting than with other types

of crops. Planting in Easy-Fill™ grow bags optimises water savings and provides for targeted fertilisation and transferring of plants.

Phytosanitary care is minor, another characteristic that makes this fruit a great option for today's growers.

Higher Profitability

According to an article published by the Spanish company Innovagri at the end of 2019 in which it contextualizes the economic advantages of the fig with respect to other crops entitled "Super-intensive dry fig production system, a profitable alternative", various points are listed that explain

the reason for the profitability of the fig in today's market.

Once the investment costs are covered, the production manages to reach very good profitability, generating an amortisation in the cost of the investment, in addition to a considerable reduction in the labour necessary for handling and harvesting.

If you are a grower and want to start your own production of fig trees, Wangara Horticultural Supplies can advise you and help you get started with your first Production Test.

For more information, visit
www.whsaustralia.com



Avocado trees in 45 litre Easy-Fill™ Grow Bags - Australia



Peat Moss and Peat Substrates for the professional horticulture

For more than 100 years the Floragard Vertriebs-GmbH in Oldenburg has successfully been developing, producing and distributing products for the professional horticulture. Since then we let this knowledge flow into our hobby potting soils. Because of that we nowadays refer to innovative premium recipes with a high standard from which the trade and hobby gardeners benefit equally. Regardless of whether indoors or outdoors, in a bed, on the balcony, in

the greenhouse or in a winter garden, whether magnificent blossoms or delicious harvest of vegetables and herbs – when using Floragard you will always find the ideal base for your project.

Floragard employees are horticultural professionals and put all their knowledge at the service of their clients. Our know-how is fully at the service of your growth company thanks to the Premium substrates from Floragard.



Our professional customers demand high-quality service and reliable product quality at the highest level. Among others, the consistent high quality is monitored by the Gütegemeinschaft Substrate für Pflanzen e. V. (Quality Assurance Association Growing Media for Plant Cultivation). The umbrella organisation is the RAL Deutsche Institut für Gütesicherung und Kennzeichnung (German Institute for Quality Assurance and Certification e. V.). Here the institute intensively investigates substrates for plants and continually studies the substrates' chemical, physical and biological properties. A company is only awarded the RAL seal of approval subsequent to the successfully concluded approval procedure, and following this, it is constantly monitored.

In this regard, the quality assurance does not only include the quality control of the finished substrates, but also continually inspects the basic materials and additives received. The consistent high quality provides a foundation for crop safety and the commercial success of your company – secured by Floragard and the Gütegemeinschaft Substrate für Pflanzen e. V. (Quality Assurance Association Growing Media for Plant Cultivation) under the umbrella of the RAL.

Our high-grade range of substrates satisfies virtually every customer's needs. In the meantime, however, the requirements and technical circumstances of numerous crops are frequently just as special and unique as the great variety found in the horticultural industry. For this reason, Floragard offers mutual cooperation with our substrate field experts and the Technical Department of Horticulture. The purpose is to work on crops, growing methods, technical equipment and climatic conditions of the horticultural business and to develop individually tailored special substrates. To determine the optimal recipe for your substrates with regard to the composition, structure, fertilization and pH-value, there are numerous possibilities.

Our products

Peat mixture for propagation:

Of German origin:

- **Floradur® Seed S:** with good water retention capacity, it is a special blend of white and black peat with a superfine structure for vegetable seedling trays.
- **Floradur® B Cutting:** special mixture of white, black peat and perlite with a superfine structure for universal sticking, with high aeration capacity; also for sowing.

- **Floradur® A Block:** special mixture of black and white peat with a fine structure for pressed vegetable clods

Of Baltic origin:

- **Florabalt® Seed 2:** special mixture of white and black peat with a fine structure and water retention capacity; ideal for summer cuttings.
- **Florabalt® Seed SB:** special mixture of white and black peat with a superfine struc-

ture for vegetable seedling trays with a high-water retention capacity

- **Florabalt® B Cutting:** special mixture of white, black and perlite peat with a superfine structure for universal transplanting with a high air retention capacity, also suitable for sowing

- **Florabalt® A Block:** a special mixture of black and white peat with a fine structure for pressed vegetable clods



Note: we have more than 4,000 compositions in our database, which illustrate the long experience of Floragard experts and the need to offer customers the most suitable solution for their particular case. Our goal is to develop a perfect product adapted to the particular requirements of our customer.

Peat moss potting substrate for horticultural production

Of German origin

- **Floradur® B Pot Medium:** Germain potting substrate for small pots starting at from 7 to 9 cm; for bedding and balcony plants
- **Floradur® B Pot Medium Coarse:** Germain potting substrate for medium-size pots of approx. 8 - 11 cm; for bedding and balcony plants
- **Floradur® B Pot Coarse:** Germain potting substrate for large pots starting at approx. 12 cm; for bedding and balcony plants, for plants sensitive to salinity.

Of Baltic origin

- **Florabalt® B Pot Medium Coarse:** Baltic potting substrate for medium-sized pots of approx. 8 - 11 cm
- **Florabalt® B Pot Coarse:** Baltic potting substrate for large pots starting at approx. 12 cm; for bedding and balcony plants, for plants sensitive to salinity

Note: it is possible to add to these products perlite, clay or other preferred minerals. There are also mixes available for potting specific crops.

Potting mixtures for perennials and plants in nursery containers.

Of German origin

- **Floradur® Pot Container:** special mixture for cover plants, shrubs and conifers: pots > 3 L
- **Floradur® Pot Perennial:** special mixture for perennial plants in pot; for spring and summer repotting (Pots > 12 cm).

Of Baltic origin:

- **Florabalt® Pot Container:** Special mix for container based on Baltic blonde peat for nurseries.
- **Florabalt® Pot Anthurium:** special mixture for Anthurium repotting
- **Florabalt® Pot Bromeliad:** special mixture for Bromeliads repotting

Note: it is possible to add to these products perlite, clay or other preferred minerals. They are also available mixtures for potting specific crops.

Our goal is to develop a perfect product adapted to the particular requirements of our customer.

Mixtures suitable for organic farming of German origin:

Seedling / transplanting

- **Floradur® Block Bio:** special mixture for pressed clods and for growing seedlings
- **Floradur® Pot Herbs Bio:** special mixture for growing aromatic potted plants, tomatoes, cucumbers, peppers and other potted vegetables (7-13 cm buckets).

Potting / Container

- **Floradur® Pot Bio:** special mixture for horticultural plants and perennials in pots; for repotting in pots or buckets of 7-13 cm.
- **Floradur® pot Container Bio:** special mixture for horticultural plants for repotting in 12-14 cm pots. (Pots > 14 cm)

Peat mixture for the cultivation of small fruits:

Strawberries and raspberries

- **Floradur® B Cutting:** special mixture of white, black peat and perlite, with a superfine structure for universal transplanting with a high air retention capacity, also suitable for sowing
- **Floradur® Pot Medium-Coarse Berries:** special mixture of white, black peat and

perlite for medium coarse potting, pots 8-13 cm

- **Floradur® Pot Coarse Berries:** Potting peat substrate for containers, boxes and ridge planting.
- **Floradur® Pot Container Berries:** extra coarse-fibrous peat substrates for containers, boxes and ridge planting

Blueberries

- **Floradur® Pot Blueberries:** Potting peat moss substrate for containers > 1L
- **Floradur® Pot Container Blueberries:** Extra coarse-fibrous peat moss substrate for large containers > 3L

Peat specialties

- **Hansatorf® 0-40 mm:** Baltic Blond Peat for soil improvement and growing on teens.
- **Florabalt® 0-5 mm:** finely sieved blonde peat of Baltic origin for the manufacture of fine growing substrate and pot
- **Florabalt® 0-7 mm:** finely sieved blonde peat of Baltic origin for the manufacture of fine growing substrate and pot
- **Florabalt® 7-20 mm:** medium-sieved Baltic blond peat for medium-sized and pot substrate
- **Florabalt® 10-20 mm:** medium-sieved Baltic blond peat for medium-sized and pot substrate
- **Florabalt® 10-30 mm:** coarsely sifted blonde peat of Baltic origin for the manufacture of coarse structure growing substrate and pot
- **Florabalt® 20-40 mm:** coarsely sifted blonde peat of Baltic origin for the manufacture of coarse structure growing substrate and pot

For more information:

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www.floragard.de



AGRO-INFORMATICS TRENDS TRANSFORMING THE INDUSTRY IN 2023

Written By:
Ron Baruchi, CEO of Agmatix

The agricultural industry looks much different today than it did hundreds of years ago. Mechanization changed agriculture's reliance on human labor and horsepower. The Green Revolution harnessed selective breeding allowing more grain to be produced per acre. Over the past few years, this change has continued, with an increasing focus on sustainability worldwide, changing farming policies to support this, and an increasing spotlight on digital agricultural tools to bring this change about.

In 2023, we'll see an increasing number of familiar challenges being addressed with new technologies. While mechanical technologies continue their development, it's the digital technologies we will see driving the most change within agriculture. Below, I'll dive into four of the largest upcoming agro-informatics trends I see coming in 2023 and beyond.

A focus on increasing production to meet growing global needs

By 2050, the Food and Agriculture Organization

estimates we will need to produce 60% more food to feed a world population reaching nearly 10 billion. Even if we hit that mark, 300 million people will still be grappling with food scarcity.

Developing countries will play a key role in this global food supply. Today, countries like the Philippines and Colombia are setting records for U.S. exports. In 2023, developing countries will continue to account for most of the growth in U.S. agricultural exports.

As indicated by the US Farm Service Agency, there will be

1.2 million fewer acres dedicated to corn production in the United States. As a result, farmers will need to have significantly higher yields from their land in order to meet the needs for ethanol, animal feed, and food with the growing global population.

In the past few years, the agricultural industry has been severely impacted by extreme weather events, COVID-19 supply chain disruptions, and worldwide economic concerns. These factors will continue, and more will join, carrying the potential to shift the reality of 2023 from these projected outlooks.

An increased use of AI based digital tools

As technology adoption grows, the digital age in farming continues to thrive. From measuring soil nutrient levels to monitoring irrigation and the use of drone imagery to map and estimate disease presence, artificial intelligence (AI) will become a constant presence in agriculture productions of all sizes.

Global spending on smart technology and connected systems in the ag space is projected to triple in revenue by 2050. That includes AI and machine learning. AI spending alone is predicted to grow at a compound annual growth rate of 25.5% between 2020 and 2026, eventually reaching \$4 billion, and with it, the capabilities of these technologies will grow.

Closely related, synthetic data is often used to validate AI models. Based on real-world data, and created by a model that uses the parameters of real-world datasets, it can be used to create a 'digital twin'. This synthetic digital twin

emulates real life, which can be particularly helpful in agriculture, where variables like soil types and weather conditions must be understood for real-world applications. With so much potential, use of this will increase, with Gartner predicting its use will outpace real data in AI models by 2030. Already trending in other industries, synthetic data is on agriculture's waiting list for 2023.

A larger use of precision agriculture, primarily to decrease costs

Precision agriculture harnesses smart, connected technology systems to improve grower outcomes. Growers can save time, money, and resources – all at a premium in today's world – with tools that support crop monitoring and targeted crop nutrition plans. 2023 will unveil exciting updates in the precision ag space.

In 2023, using precision AgTech tools for precise fertilizer application will be more important than ever, driven by rising fertilizer costs. Fertilizer costs have increased the most of any input in 2022, with projections that this will further increase over the coming year. With these increasing costs, precision Ag and digital tools for fertiliser use are increasingly becoming a worthwhile investment.

A continued focus on sustainability

Sustainability isn't a new trend or topic in 2023, but it's a safe bet that companies will double down on their efforts. To do so, they'll need to quantify their impact on sustainability. The agriculture industry will have similar opportunities to engage in sustainability efforts with renewed vigor.

Along with positively impacting the environment, financial benefits of environmental sustainability also exist. As well as the numerous carbon markets available for US producers, the USDA's Natural Resources Conservation Service is offering technical assistance and financial support for improving air quality, conserved ground and surface water, soil health, improved or created wildlife habitat, and more.

Staying abreast of all the changes in the agriculture industry can be a challenge. However, with pressures from a changing climate and growing population, adapting is necessary.

Quickly understanding the impact of new technologies or production practices on crop yield and quality is critical in driving profitable and sustainable change. Reviewing available research can help to create crop models to predict plant growth and development. Better yet, conducting your own research through field trials can give more accurate results for your own practices, soil type, climate, etc. This is another area we see expanding, and for good reason, as farmers become increasingly invested in getting the most out of their land.





ADVANCED TECHNOLOGY FOR NURSERY GREENHOUSES PRODUCTION OF PLANTS A LA CARTE

SIAP SPAIN Co.

Spanish greenhouse manufacturer, with large experience in the Middle East and mainly in Saudi Arabia Kingdom.

Manufacture for nurseries production of trees for gardens and reforestation, production plants for landscaping and horticultural plants.

Modern equipment for agriculture applied to high production for greenhouses and nurseries with water and energy saving.

Cooling system with automatic bleed off. Increasing pads life

and reducing water consumption.

Automatic curtain for shading and energy saving, to reduce temperature in summer and increase in winter night.

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High volume greenhouses for a better control of your environment and higher productions.

Heating systems, gas-diesel air heaters, boiler heaters.

SIAP manufactures the most advanced software in climate



Mr. Javier Contreras
Sales Manager Middle East

control and Fertigation system, applying.

SIEMENS industrial PLC technology in nursery greenhouses, obtaining the best results for the control and monitoring of your greenhouse and nurseries.



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SIAP SPAIN

Your reliable Greenhouse Manufacturer

- ★ Germination chambers: manufactured to provide the best environmental conditions of humidity, temperature, oxygen according to the crop are used.
- ★ Irrigation systems: micro-sprinkler and boom system to irrigate with high efficiency.
- ★ Cooling system: Top and lateral window, fan-pads system, powerful fogging system.
- ★ Heating system: gas-diesel heaters.
- ★ Automatic horizontal curtain: Shading and energy saving.



TOP QUALITY COMPONENTS FOR MACHINES FOR THE DISTRIBUTION OF CHEMICALS IN AGRICULTURAL INDUSTRY

Polmac Srl has been in the market of machines for the distribution of agriculture pesticides and herbicides since 1972. Our products are produced to control and measure the management, mixing and distribution of chemicals in agriculture, in order to reduce to a minimum the environmental impact and contact with these products by operators. Greater precision in dosing, more safety in

performing activities, compliance with the most stringent rules and the best end results. Our primary objective had been that of designing and manufacturing a complete weeding machine targeted exclusively for the Italian market. Over time, we specialized in the production of components and accessories for machines for the distribution of pesticides and herbicides, while also expanding our sales in foreign

countries. Every year we invest a significant share of our turnover in Research & Development. Thanks to our specialist team we produce technical drawings, prototypes and new production moulds, while maintaining constant product innovation and customization to satisfy the requirements of the Italian and International market.

For more information, visit www.polmac.it



NEW HOLLAND AGRICULTURE DEBUTS WORLD'S FIRST LNG TRACTOR

New Holland Agriculture brand unveils the next step in its Clean Energy journey with the T7 Methane Power LNG (Liquefied Natural Gas) pre-production prototype tractor.

T7 LNG: the right blend of autonomy, power, comfort and opportunity

A farm's carbon footprint is a major factor in determining its sustainability. And farmers still need powerful tractors that can run around the clock. Natural gas, and especially biomethane, are presently the ideal solutions to guarantee higher horsepower machine performance, while also lowering emissions and reducing operating costs.

The T7 Methane Power LNG will more than double the autonomy compared to a CNG design whilst boosting overall farm sustainability. In comparison to the T6 Methane Power CNG, this is a fourfold increase in fuel capacity. LNG is also a key facilitator for the expansion of CNH Industrial's broader future natural gas portfolio, particularly towards larger and heavier agricultural

equipment, as well as construction equipment.

The T7 Methane Power LNG pre-production prototype offers unparalleled performance for an alternative fuel tractor. With its 270hp, it delivers the same power and torque as a diesel tractor while delivering autonomy without the need for any extra tanks. It is also more sustainable, being better than carbon neutral when powered by Liquefied Biomethane sourced from livestock manure/slurry.

T7 Methane Power LNG: ingenious design, productivity and tech

The T7 Methane Power LNG pre-production prototype is the latest demonstration of CNH Industrial Breaking New Ground by developing a world first that will better enable farmers to be more sustainable, energy independent and productive, all while improving their bottom lines.

Beyond its energy efficiency and notable environmental credentials, this machine is equipped with bold and functional future-facing enhancements to marry 'Great

Iron' with 'Great Tech'.

An inspired aesthetic from CNH Industrial's in-house Design Team presents a tractor that is ahead of its time, with a new 'Clean Blue' color accenting sustainable alternative fuels. The all-new exterior features fit with the Brand's new signature design style, which can be seen in the reimagined bonnet with the illuminated New Holland iconic leaf. The exterior is completed by powerful LED taillights with incorporated signature leaf, a C-Pillar illuminated leaf and gloss black wheels with custom Clean Blue accents. The cab incorporates a full length skydome roof for enhanced visibility and greater sense of space. The innovative SideWinder™ Ultra armrest, new larger IntelliView™ 12 touchscreen and the CentreView™ fixed hub steering wheel mounted display makes work intuitive – while the ergonomically shaped seats in leather and Alcantara with contrasting stripe and embroidered logo, look sporty as well as being comfortable.





MATERMACC'S MS8230 PRECISION SEEDER IN COMBINATION WITH STRIP-TILL FOR A SMART, ECOLOGICAL AND SAVING AGRICULTURE

The term strip-till refers to an agronomic technique of strip tillage: only specific, well-defined portions of the soil are worked while the inter-row spaces remain untouched, ensuring the protection, balance and nutrient richness of the soil. As the natural resources of our fields are limited, the Strip Tillage method is suitable for optimising soil yields while limiting soil degradation.

In fact, the strip-tillage method combines the advantages of classic tillage with no-tillage: several tillage cycles such as ploughing, seedbed preparation, fertiliser burial and seeding can be carried out effectively in a single operation. This results in considerable time and cost savings.

Strip-tillage has achieved excellent results over the years on maize and soybean crops, in first and second harvest, but can be used regardless of the type of crop. The seeding of the combined crop must be done with a seeder equipped with a precision seeding system to ensure that the tilled row is perfectly centred, leaving intact the rows covered by crop

residues that will be transformed into organic matter.

MaterMacc customer Wojtyla embraced this technique and took to the field with the MS 8230 12-row precision planter in combination with a 6-metre strip-till from the well-known Polish manufacturer Czajkowski. Wojtyla is a structured contractor based in North West Poland, near the town of Szczecin, close to the German border. With the MaterMacc seeder he sows sugar beet, maize and rape (the main crops for the Polish market). The customer appreciates the seeder's flexibility of use for different crops, its ease of conversion from one row to another, and its ease of transport by road thanks to its small footprint. A further strength of the MaterMacc seed drill is its compactness and light weight, which means that it does not have an excessive influence on the overall weight of the 'working configuration'.

The technique applied by the customer is a combination: the strip-till works the strips of soil predestined for sowing, fertilising at the same time. The

seeder coupled to the machine follows it, distributing, in precision seeding, the crop desired by the customer. The solution combined with the MaterMacc seed drill avoids double passage, saving the contractor considerable time and money, while maintaining high seeding quality thanks to the electronic management of the MS8230 from the tractor's Isobus terminal.

What are the main agronomic and economic advantages of this seeding technique?

- Reduction of work time and speed of execution by reducing everything to a single pass over the soil
- Reduction in fuel consumption and consequent reduction in emissions
- Increased effectiveness of fertilisers as they are placed exactly in the tilled strip
- Improved soil structure, which is left undisturbed and free for a large part
- Reduced soil trampling due to the reduction of soil passages
- Applicable to a wide range of crops and soil types

For more information, visit www.matermacc.it



IRRIGATION UNIFORMITY AND HYDROGEN PEROXIDE

As a grower, you care for your crops by providing them with all they need: light, nutrients, water, and the right growing conditions. Ironically, the system you are using to provide your plants with water and nutrients may also double as a vehicle for unwanted guests in the form of pathogens such as Pythium, Phytophthora, and other fungi and bacteria which can damage crops and raise food safety concerns. This host of organisms is usually present in irrigation water in small amounts, but tends to proliferate in the water system in the form of biofilm. Biofilm is not only a hotbed for pathogen infestation, but it also has a strong negative impact on irrigation uniformity as it blocks emitters. The effects of

non-uniform irrigation are well known to growers, as plants receive uneven amounts of water and fertilizer, which leads to stress in the plants that receive less water. As a result, yields will be lower, and non-uniform growth leads to strong variances in time-to-market across the crop – both of these factors

have a negative impact on profitability.

Biofilm as a breeding ground

Ideally, you would use 100 percent clean water in your cultivation, but unfortunately that's not realistic. You may get your water from a well, from a wastewater treatment plant, or by reusing irrigation

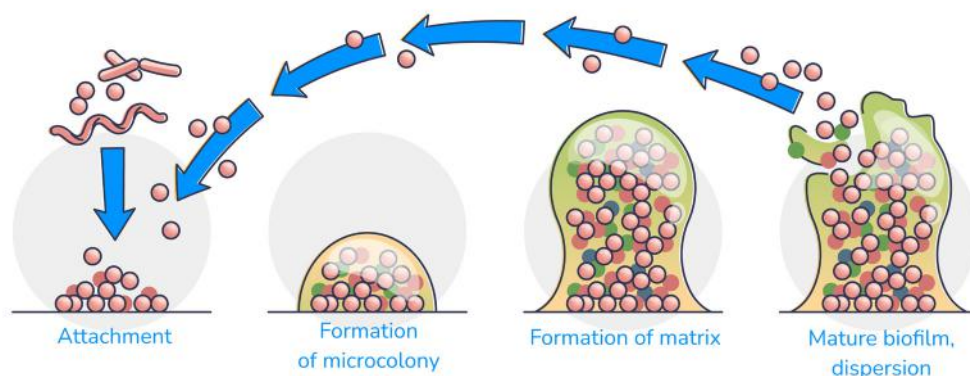
	Chlorine	Nanobubbles	Industrial peroxide	Ozone
Efficacy for irrigation uniformity	✓	✗ (very limited effect on organics)	✓	✗ (short molecule has local effect)
Residue-free	✗	✓	✗	✗
Improves water oxygenation	✗	✓	✓	✓
Safe to use	✗	✓	✗	✗
Autonomous	✗	✓	✗	✓

water. That water probably contains a small quantity of microorganisms like bacteria and algae spores. When those come into contact with the inside of your irrigation system, biofilm will accumulate.

This occurs in four stages:

- **Attachment:** Bacterial cells attach to an abiotic surface
- **Colony formation:** Microcolonies are formed, given the right growing conditions for them to thrive
- **Growth:** The microcolony continues to grow into a matrix, which constitutes the biofilm
- **Dispersal:** Macrocolonies are formed, leading to mature biofilm stage and the dispersion of cells, which in turn can further colonize the irrigation system

That biofilm is a fertile breeding ground for pathogens and can lead to blockages in the irrigation system, so you'll want to prevent biofilm from forming in the first place, or remove it if it's already present. Not doing so is often very costly in terms of lost production, as well as in treatments for plant disease which fail to resolve the root cause of the problem.



But how can biofilm be addressed? The table below compares some solutions for preventing and removing biofilm.

Solutions such as ozone or UV are not effective with biofilm, as they only have a local effect which does not extend along the irrigation lines. Nanobubbles in turn have a very limited impact on the organics that form the biofilm, and struggle to achieve the required level of biofilm control.

An effective way to prevent the buildup of biofilm is by using oxidizers such as chlorine or hydrogen peroxide. Chlorine, while effective against biofilm, is not a good solution as it could also damage drippers. In addition, chlorine leaves byproducts after use which remain in the water or soil, negatively affecting the plants.

Studies on hydrogen peroxide have shown its effectiveness in combating biofilm and preventing clogging of the irrigation system, while having the added benefit of oxygenating the water. Once dosed into the irrigation system, hydrogen peroxide will dissolve very well in water. As soon as it contacts any organics it will oxidize

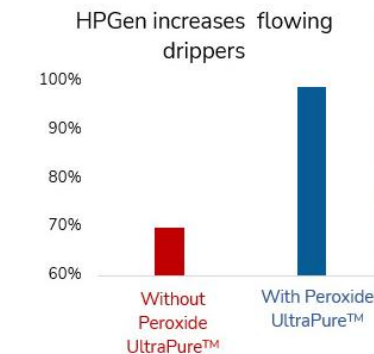
them. This will slowly erode biofilm, and importantly it will prevent the formation of more biofilm. It is very common to see a gradient in concentration from the injection point down to the end of the irrigation lines, with the gradient being more steep the more organics a system has. After use, peroxide molecules will become water and oxygen. However, industrial peroxide contains more than just peroxide, and accordingly it has a few major drawbacks. At high concentrations, hydrogen peroxide is a hazardous substance and requires strict safety measures. It also comes with high levels of impurities, especially additives consisting of heavy metals and chelating agents used to minimize losses of hydrogen peroxide during transport and storage. These additives have a detrimental effect in the water and crop as they accumulate over time. Notably, these impurities are known to accumulate in the substrate and root zone of the plants, where they create a local area with high salinity. Not only does this impact osmotic pressure in the water in the vicinity of the root zone, which hampers fertilizer uptake, but it also blocks the water paths

one	UV	HPGen Peroxide UltraPure
lived (le, only l effect)	✗ (only has effect at the point of contact)	✓
	✓	✓
	✗	✓
	✓	✓
	✓	✓

to the root zone. This means that despite using hydrogen peroxide, biofilm and pathogens still occur and adding more peroxide only exacerbates the problem at plant level. Finally, users depend on an often volatile supply chain with uncertain availability and pricing.

Peroxide UltraPure™: an effective weapon against biofilm

Peroxide UltraPure™ produced by the HPGen system, circumvents these drawbacks by producing an ultra-pure form of hydrogen peroxide, Peroxide UltraPure™, directly on-site. Produced at safe, low concentrations, directly at the point of use, no stabilizers are required. This makes it ideal for agricultural use, where purity is vital to achieve the full potential of hydrogen peroxide: having no stabilizers means peroxide has optimal reactivity, so it will be able to reach the full depth of the irrigation system, including substrate and plant root zone. These are kept free of biofilm, promoting a healthy uptake of water and nutrients that improve health and



Blueberry plantation comparing side by side the effect of Peroxide UltraPure.

vigor of the plants. The HPGen system also operates autonomously: hook up the system to your irrigation system, switch it on and it will take care of the rest.

The effectiveness of Peroxide UltraPure™ against biofilm

The safe concentrations of Peroxide UltraPure™ produced by HPGen may have you wondering: How effective is it against biofilm?

We've installed numerous HPGen systems generating Peroxide UltraPure™ on-site, used in a variety of crops, in different parts of the world, where irrigation water quality also varies greatly. Peroxide UltraPure™ has been shown time and again to be effective in combating biofilm.

In field studies, Peroxide

UltraPure™ has been shown to achieve very uniform irrigation in drip systems. In a controlled test on a 12 hectare organic blueberry plantation, about 30% of the drippers were found to flow below accepted values. Within a few weeks of starting injection of Peroxide UltraPure™, nearly all drippers were back to flowing water. This had a very positive effect on the crop, which grew with more vigorously and healthily.

Based on very comprehensive studies and experience across the globe, we are able to recommend optimal dosing regimens, which are also backed by academic studies (e.g. Effectiveness of hydrogen peroxide treatments in preventing biofilm clogging in drip irrigation system). This includes continuous dosing with recommended concentrations based on multiple parameters including water quality, irrigation system, irrigation regime, crop, climate and others. HPNow has numerous case studies and will be happy to advise the best approach for your particular situation.

For more information, visit www.hpnow.eu



Portugal avocado plantation, with irrigation water from dam. Drippers from untreated irrigation lines (left, control group). The brown matter on the channels is accumulated bio-foul. Emitters from HPGen-treated irrigation lines (right) are nearly as clean as new after two months of dosing Peroxide UltraPure.

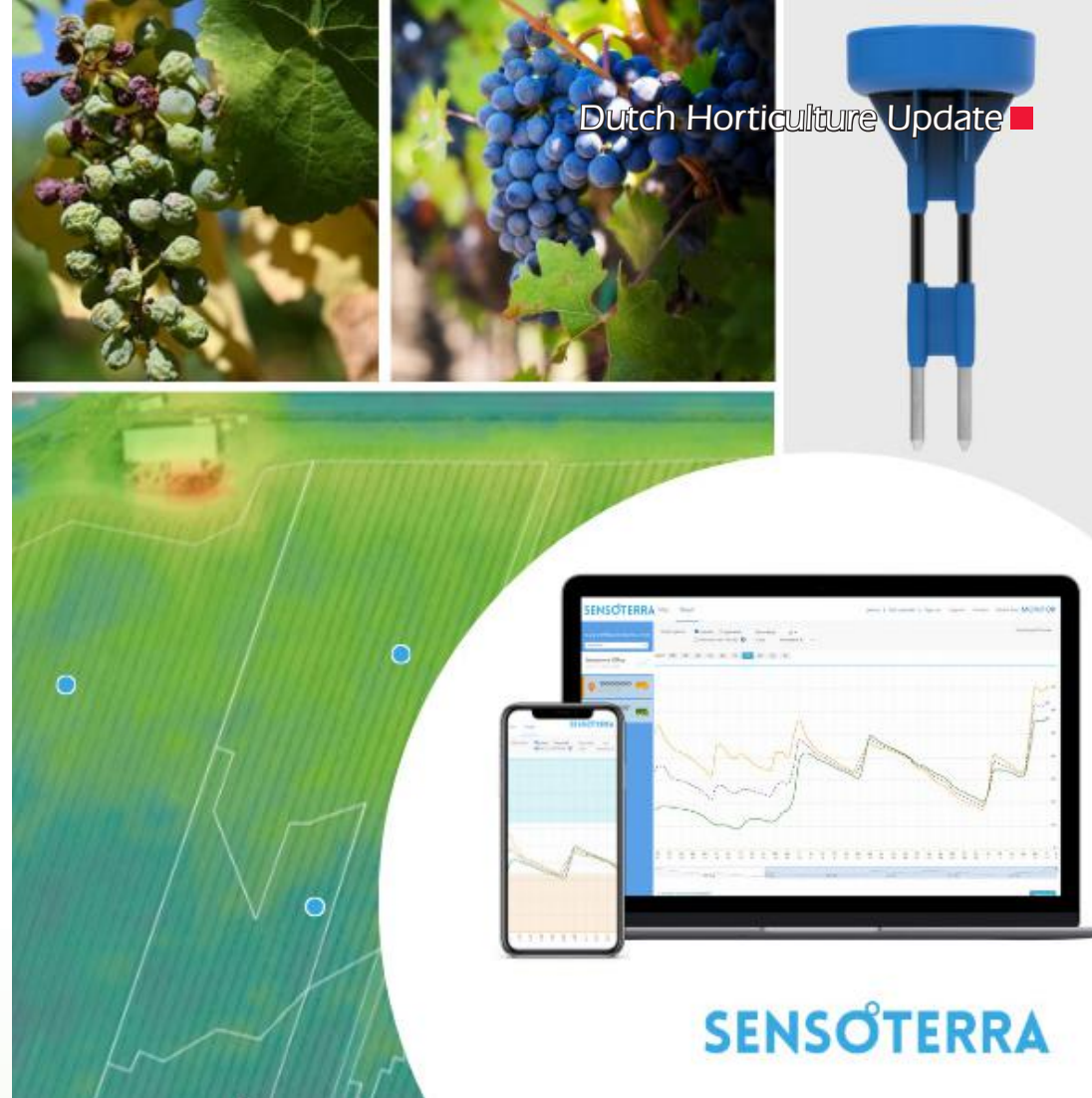
Precision irrigation is an increasingly important management process for horticulturalist, across the globe. With increased demand for both high plant quality and yield, along with the increasing market volatility of chemical input availability, horticulturalist are looking for optimized solutions for irrigation and fertigation processes on their fields.

Sensoterra partner, Verdi Ag, developed a modernized solution to irrigation optimization. They break up large irrigation, and re-build into micro-irrigation management zones. This prevents over- and under-irrigation across a field, using precision irrigation techniques.

Working with orchards and vineyards, Verdi Ag has worked to save an excess of 7 million liters of water in 2022 alone, with this method of precision irrigation. Vineyards are often found on sloping hills, of gravelly mineral rich soils. These soils offer unique profiles of the terroir, but often are lacking in soil moisture retention ability, easily stressing the plant and threatening yield. Growers frequently irrigate to maintain plant growth and quality, but without key data insights, this can be a challenge to perfect.

"We often see that the vines are growing over-vigorously, with the fruit being very large, and the sugar content too high," says Roman Kozak of Verdi Ag.

By limiting water availability to areas which are over-irrigated, there is a reduction of water waste, and an improvement of fruit quality. And splitting up irrigation from one



SAVING 7,000,000 LITERS OF WATER WITH PRECISION IRRIGATION

centralized system to smaller management zones, growers can monitor and optimize activities on a much more precise level. Placing Sensoterra sensors in strategically determined micro-irrigation zones, means improving irrigation needs for the plant, increasing quality and yield.

"One of our customers reduced irrigation by 80%. This improved grape quality, resulting in a marketable price increase three-fold of that of the previous season," Roman Kozak, Verdi Ag.

With improved uniformity, consistency of quality and vigor of the vineyard, optimized irrigation also reduced the likelihood of diseases like powdery mildew, which can spread rapidly in an affected crop. Helping growers gain control of irrigation, benefits the crop, and reduces risks of irrigation induced disease.

Learn more about how precision irrigation can help save water and improve plant yield and quality by visiting www.sensoterra.com

MOWREQ AND YESHEALTH GROUP SIGN DEAL TO BUILD SAUDI ARABIA'S LARGEST INDOOR VERTICAL FARM



Agtech companies, Mowreq (Mowreq Specialized Agriculture Co.) and YesHealth Group (YesHealth Agri-Biotechnology Co., Ltd.) have initiated a joint venture to develop a network of indoor vertical farms throughout the Kingdom of Saudi Arabia. The JV, Vertical Farms Company, will begin by building the Kingdom's largest indoor vertical farm in Riyadh. This first farm is slated to be fully operational by Q4 2023, providing jobs and healthy, sustainable produce to the local community.

Mowreq already supplies vertically farmed produce to consumers in Jeddah, under the brand name Janafarm.

YesHealth Group currently operates a profitable, large-scale indoor vertical farm in Taiwan, and cooperates across

several indoor vertical farms in Europe. Its combined operations employ more than 150 people worldwide and produce over 2,500 tons of leafy vegetables, annually. The Riyadh farm will be operated jointly by Mowreq and YesHealth Group during a 3-year technology transfer phase, training local talent to take over the long-term operations.

Total investment in the Mowreq and YesHealth Group JV, Vertical Farms Company, is valued at more than 100 million Saudi Arabian Riyals, or approximately 28 million US dollars at the current exchange rate. The project is backed by Saudi venture capital and funds.

In line with the Saudi 2030 Vision, the partners will create 50 full time jobs at the Riyadh farm, and they aim to

create more jobs over the next five to ten years, leading development of the controlled environment agriculture industry. Education will be provided to advance talent, giving the youth the skills they need for jobs of the future. Continued development of the industry's infrastructure will further diversify the economy, helping to ensure food security, and promote healthy lifestyles.

"We built the Kingdom of Saudi Arabia's first indoor vertical farm and now we're building the Kingdom's largest indoor vertical farm," says Modar Hisham Nazer, Co-Founder of Mowreq and Chairman of Vertical Farms Company. "This massive, new farm that we're building in Riyadh, will enable more of our compatriots to benefit from locally-produced Janafarm products, which are always clean, fresh, and free of pesticides."

"YesHealth Group has overcome the operational challenges of indoor vertical farming in Subtropical Asia," says Jesper Hansen, CCO of YesHealth Group. "The Middle East is our next challenge. We will guide the Riyadh farm through its initial phase of operation, with the aim of maximizing output and efficiency at the high level we achieve in our Taiwan farm."

POLISH PLANTER BAGS

MARTEX®-Jerzy Marek Strenkowski, is a family owned company from Poland engaged in the production and supply of textile products for nurseries, including those can be effectively used in the temperate, dry or even hot climate.

The company offers different kinds of products including a series of containers under the common name of ARBO®. Also there are nursery and transportation bags, bags for general purpose and for the collection of small plastic items (plastic bottles, cans, AL), household waste utilization, and many others.

Under the brand of

MARTEX®, the company offers mats for protection against weed, containers for ground and water perennials, expanding tape for connecting of tree and its support, multicolour marking tape, protective material for draining pipes and trees located near the roads and streets, tunnels/ sleeves for ventilation and weights used in foil tunnels.

Additionally, the company offers the following range of products: jute textile (in bales and KARO type clothing), jute felt, knitted fabric/net for shading, bedding material for application directly on ground, geo-textile, foil and foam with thermo-insulative properties for

plants and objects (in bales and variety of formats), capillary mats for tables, wrapping band for trees, stabilizers of ground in the slopy area.

Water saving jute mat, for application in dry and hot climate, which effectively reduces water evaporation and its assimilation by weed; aluminum foil coated container which reflects sunlight, and thermoinsulative inserts, for application inside bags, pots or directly on ground are also included in the product range.

MARTEX® delivers its products to more than 24 countries in Europe.

For more information, visit www.arbo.pl



UAE BOLSTERS AGRICULTURAL PRODUCTION, BOOSTS FOOD INDEPENDENCE

The UAE's AgriTech sector has been catapulted to the top of the nation's priority list following food security concerns brought about by the Covid pandemic, according to a report titled AgriTech in the UAE Industry Landscape Q3 2022, which was jointly published by Sharjah Research Technology and Innovation Park (SRTIP) and Deep Knowledge Analytics (DKA), a subsidiary of Deep Knowledge Group (DKG).

As the UAE imports more than 85% of its food – a process which was severely disrupted by global lockdowns – the UAE government has taken decisive action to adopt more self-sustaining practices to ensure food security for its citizens and residents.

Outlined in a comprehensive report, the implementation of innovative food production practices has proven to be a fruitful exercise for the UAE

leaders, who plan to harness the innovation and export it to the world.

DKA conducted deep analysis into 100+ companies, 30+ investors, 10 government agencies and hubs and eight subsectors to produce an overview of the UAE's novel approach to agriculture.

The problems facing the sector include a burgeoning world population, which is expected to reach almost 10 billion by 2050, boosting agricultural demand by 50% compared to levels experienced in 2013. These are topped by the UAE's harsh climate, making food security a constant concern.

Furthermore, the agricultural industry both contributes to, and is affected by, climate change. For example, agriculture currently accounts for 70% of water use globally, and the world's food systems are responsible for more than one third of global anthropogenic

greenhouse gas emissions.

Additionally, one third of food produced globally is either lost or wasted, generating around 1.3 billion tons per year, worth approximately \$1 trillion. In developing countries, 40% of losses occur at post-harvest and processing levels.

As food security has always been important to the nation, the UAE government launched its National Food Security Strategy in 2018, with the goal of increasing food production by 30-40% in 10 years. The plan is for 50% of the food consumed in the Emirates to be locally produced by 2051, compared to 20% in 2022.

Commenting on the report findings, His Excellency Hussain Al Mahmoudi, Chief Executive Officer of Sharjah Research Technology & Innovation Park, said: "The UAE government has set ambitious targets to boost food security in the coming years. The goal of taking locally produced food to 50% by 2051 is certainly achievable. At SRTI Park, we are proud to have a new breed of startups that are pioneering alternative agricultural technologies, including hydroponics and vertical farming. Investments in AgriTech startups are estimated to have skyrocketed to \$51.7 billion from venture capitalists in 2021, an increase of more than 85% over 2020. We are proud to jointly conduct this comprehensive report with DKG, as it reflects the UAE's bold initiatives and targets to

مجمع الشارقة للبحوث
والتكنولوجيا والابتكار
Sharjah Research Technology
and Innovation Park



achieve food security against so many odds."

Innovations in the Agricultural Sector

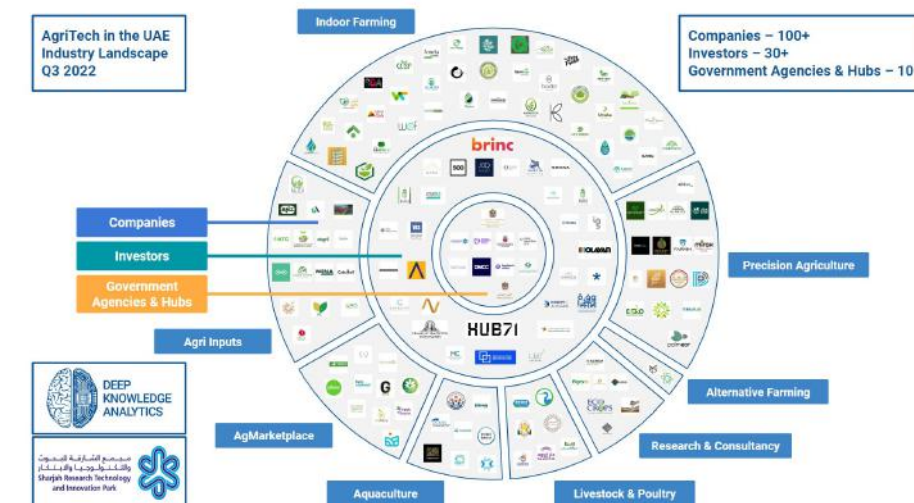
Dmitry Kaminskiy, General Partner, Deep Knowledge Group, said: "Some of the innovations that are boosting the UAE's food security include the use of solar power technologies which enable the use of salt water, rather than fresh water, as the primary input for food production. Other initiatives include the reduction of food waste and greenhouse gas emissions, and the implementation of vertical farming – a sector in which the UAE has major potential. We are delighted to continue our collaboration with Sharjah Research Technology & Innovation Park to contribute to the advancement of some of the most critical sectors of the UAE's economy."

Hydroponics, alternative crops, greening the desert and alternative proteins also feature on the list of innovations to boost food production in the UAE, backed by technology which incorporates robotics, AI and blockchain.

The UAE's Agri Landscape

The largest facets of the UAE's AgriTech sector can be quantified as follows: 36% (indoor farming), 15.9% (precision agriculture), and 15% (Agri inputs). Around 65% of the nation's AgriTech companies are micro-sized enterprises with fewer than 50 employees. Agriculture in the UAE is projected to register a CAGR of 3.5% between 2022 and 2027, based on the nation's commitment to grow the industry exponentially in the near future.

While the UAE's food



production may only represent a miniscule percentage of global agricultural production, the implications of this forward-thinking strategy extend beyond the national borders.

Previously, the transference of technologies from temperate regions to those closer to the equator have not been successful due to the drastic differences in agri-climatic conditions.

There are currently 66 UAE companies addressing the sustainability issue, which was enhanced by investment of more than half a billion dollars into UAE-based companies in 2021, or around 1.1% of the global capital invested in AgriTech. 66% of these are UAE-based investors, followed by those from the US, the UK and Switzerland, as well as other GCC countries.

The global AgriTech market is projected to reach \$22.6 billion by 2025, creating a significant opportunity for investors and companies looking to further the advances of new technologies. Factors driving market growth include the adoption of advanced technologies and growing demand for food traceability and security.

Some of the key players in

the UAE's AgriTech startup sector include Pure Harvest Smart Farms, Madar Farms, Farmin, The Platform, Palmear and others.

For AgriTech investors, the UAE is a particularly attractive option thanks to its favourable climate and infrastructure, and strong government support of initiatives to enhance food security.

Looking ahead: AgriTech in the UAE

Abu Dhabi operates agricultural technology company Silal, which is upgrading 80 farms with new smart monitoring and irrigation technology. Silal will invest \$54 million into the programme in the next two years to boost sustainable agriculture in line with the national AgriTech strategy.

The National Food Security Strategy 2051 drives further technological improvements to achieve strategic goals, including a 13% reduction of food loss and waste, a 35% reduction in food safety incidents, 100% successful emergency drills, a 15% increase in production of select strategic food items, and a 30% yield improvement from new technology-enabled production.

"DKA CONDUCTED DEEP ANALYSIS INTO 100+ COMPANIES, 30+ INVESTORS, 10 GOVERNMENT AGENCIES AND HUBS AND EIGHT SUBSECTORS TO PRODUCE AN OVERVIEW OF THE UAE'S NOVEL APPROACH TO AGRICULTURE."



FEED PRICES ON THE RISE, CAN ALTERNATIVE FEED MATERIALS BE USED FOR CHICKEN DIETS?

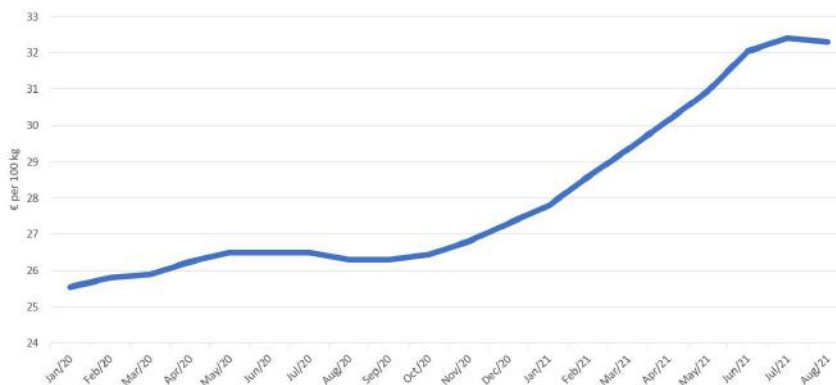
By Estella Leentfaar,
Nutritionist,
Hendrix Genetics Layers

It is well known that cost of feed is the major cost of egg production. Feed prices have been on the rise for more than 1 year. Among the reasons for the rising feed prices are disappointing harvest related to climate change (drought, fires, and severe flooding) but also related to a higher demand of raw materials because of the recovery of the global demand for animal protein (declined due to COVID-19) and an increasing demand of feed related to the recovering from African Swine fever.

The rising feed prices have their direct impact on the composition of layer feed and are resulting in the increase in the use of alternative feed stuffs in

laying hen nutrition. The most expensive nutrients in chicken diets are energy and protein, which are at the same time the major nutrients in a laying hen diet. The energy intake in a laying hen mainly depends on the hen's maintenance cost, her activity and the energy

needed to maintain the required body temperature. The average daily protein intake depends on the requirements to produce eggs and the hen's maintenance. The total daily cost of feed is depending on the feed price (price paid per kg/feed) and the total kg of



Source: (Wageningen University & Research, 2021)

feed consumed by the flock. Depending on the market situation, it can be cheaper to steer to a higher feed intake with a lower feed price or vice versa. As laying hens mainly eat according to the energy level present in the feed, it is essential to track the flocks feed intake as accurate as you can and to formulate the protein levels according to the recorded feed intake.

Using alternative feed materials and a higher inclusion of by-products will likely reduce the feed costs. Examples of commonly used alternative protein sources to replace soybean meal are sunflower meal, rapeseed meal, cotton seed meal, groundnut meal and distiller dried grains with soluble (DDGS). When using alternative ingredients in formulating poultry diets, it is key to formulate based on the digestible amino acid levels. Most protein sources have a different amino acid pattern compared to that of soybean meal, formulating on digestible amino acid levels will help to maintain both the correct amino acid balance and level.

Most alternative ingredients have lower digestibility and utilisation rates compared to soybean meal (shown in the table above). Part of this lower digestibility and utilisation rate is caused by a higher level of antinutritional factors in these alternative protein sources, like gossypol, glucosinolates and trypsin inhibitors. Another important factor is the quality of the raw materials itself. Most by-products are residues that stay behind during the

Raw material	Protein digestibility laying hens
Soybean meal	86%
Sunflower meal	85%
Rapeseed meal	76%
Cottonseed meal	65%
Groundnut meal	85%
DDGS	71%
Meat and bone meal	73%

Source: (CVB Feed Table, 2018)

production process of oils, ethanol, etc. As a result, the nutrient composition and protein quality of the product may vary greatly between processing plants and even between production shifts.

Proper protein digestibility results in better feed efficiency and therefore has its positive impact on the sustainability of egg production. Furthermore, a higher protein digestibility results in less protein leftovers towards the end of the intestines and therefore a reduced risk on intestinal health. Protein digestibility depends heavily on feed processing, like heat treatment, the grinding quality, the type of raw materials, other ingredients like enzymes, and very important overall intestinal health. It is essential to introduce alternative protein sources already during the rearing period to the chicken diet, and slowly introduce new ingredients. When adding a new feed ingredient to the poultry diet, take a close look to the impact on feed consumption and the production results, careful monitoring of this data will help you to better understand what the impact is of the changes to the diet. Analysing the results will help to prevent an

overestimation of the digestibility of your new feed composition.

In poultry breeding, it is key to already breed and select the pure line breeding stock on diets that are containing alternative feed materials, this will help to breed for commercial chicken breeds that can utilize these alternative feed materials. All the laying hen breeds of Hendrix Genetics have been selected on diets with high levels of antinutritional factors and lower digestibility rates. Therefore, all the Hendrix Genetics Breeds can cope with well formulated chicken diets containing raw alternative sources of raw materials. As it is expected that feed prices will remain high in the coming years, we are confident that our chicken genetics will be able to contribute towards a sustainable future of egg production.

References:

CVB Feed Table. (2018). *Chemical compositions and nutritional values of feed materials*. The Netherlands: Federatie Nederlandse Diervoederketen and Wageningen Livestock Research. Wageningen University & Research. (2021). *Agricultural prices*. Retrieved from Agrimatie: <https://www.agrimatie.nl/Prijzen.aspx?ID=15125>

VEOLIA EXTENDS WATER REUSE PROCESS FOR LEADING QATARI DAIRY PRODUCER BALADNA, REDUCING THEIR WATER CONSUMPTION BY MORE THAN 50%

Following the first stage completed in 2020, Qatar's leading dairy producer Baladna renewed its trust in Veolia Water Technologies to extend the wastewater treatment capacity at its farm in Al Khor, north of Doha. Baladna is home to over 24,000 cows that are spread over 2.6 million square meters, and will now recycle 22,000 m³/day of wastewater.

Committed to ecological transformation, Veolia Water Technologies is working with Baladna Food Industries to support their sustainability plan and recycle their wastewater. The partnership started in 2020 with the design and construction of a 6,000 m³/d wastewater treatment plant, allowing for the treated water to be reused for irrigation within the farm and, following further treatment by reverse osmosis, to spray and cool the cows during hot summer months. Based on this successful project, Baladna decided to go further in 2021 by tripling the treatment

capacity to 22,000 m³/d.

Baladna CEO, Piet Hilarides expressed his enthusiasm for the partnership with Veolia: "After a first successful project with Veolia, we strengthened this partnership in line with Baladna's commitment to sustainable water management. The holistic approach to reuse treated wastewater and limit environmental impact of open lagoons are key developments. We are enthusiastic to expand the treatment capacity of reusable water on a larger scale, reducing our freshwater consumption by more than 50%. This project marks a major milestone on the sustainability journey of Baladna and will significantly contribute to improving the environment for the surrounding Al-Khor area."

The system includes an initial separation step with a capacity of 22,000 m³/day. 12,000 m³/day will be recirculated for flushing barns, with the remaining

10,000 m³/day further treated in an MBR system followed by a polishing reverse osmosis step to produce water to replace the potable water currently used in the soaking and misting systems of the farm.

Thierry Froment, CEO Veolia Water Technologies Middle East explained: "This project will reduce the strain on freshwater resources while eliminating the need for huge water treatment lagoons and the visual and odor pollution caused. This collaboration also highlights a significant achievement in the sustainability plan of Baladna and, in line with Veolia's purpose of ecological transformation, showcases a holistic way to reuse treated wastewater. We are extremely proud of the relationship between Baladna and Veolia in Qatar."

For more information, visit
www.baladna.com
www.veoliagroup.com



THE LARGEST F&B SOURCING EVENT IN THE WORLD

Gulfood underscores the UAE's status at the forefront of sector change and leading the role in tackling global issues. Driving creativity and change, on 20-24 February 2023, the 28th edition of Gulfood will continue to unite food and beverage communities around the world, and act as an industry trend springboard and a global sourcing powerhouse.

5000+ companies from more than 120 countries, industry thought leaders, and the world's greatest chefs will chart the way forward and inspire industry-wide transformation for the good of the entire ecosystem.

Top Table will bring the culinary community together with a star-studded line up of internationally renowned chefs. Furthermore, the ever-engaging Chef Talks will offer deeper insight with intimate talks getting up close and personal

with culinary icons.

Aspiring young chefs looking to lead the region's F&B industry in the next 20 years will find a place to showcase their skills at YouthX, which will see young and upcoming chefs from leading hotels and restaurants come together in a culinary competition like no

other and be rewarded for their contribution to the region's growing influence on the global gastronomic scene. Partnering with the International Centre for Culinary Arts, the competition is bigger than ever before and the stakes higher.

Get a head-start on the topics and trends that matter at Gulfood Inspire. The stage is set for impactful conversations in the world of F&B. Access a profound platform to learn, debate, network, and benchmark the latest technologies.

Gulfood is a force that gives rise to transformation in the industry today, serving as a foundation for and

spearheading key shifts in the industry, for the good of the entire F&B ecosystem tomorrow.

We are the source, the global focal point where the international food community comes together in Dubai – and continues to cement the city as the global food capital of the



IPM ESSEN - FOUR DAYS FULL OF TRENDS, INNOVATIONS AND EXPERT DISCUSSIONS

IPM ESSEN will be taking place at Messe Essen from 24 to 27 January 2023. Numerous specialist forums, special shows and themed tours invite visitors to find out about trends, innovations and challenges of the future. The fair and its cutting-edge complementary programme also offer numerous opportunities to make valuable contacts and to take order and investment decisions.

These are the highlights of the fair at a glance:

Innovations Showcase

The competition for the best

plant innovations has been held at IPM ESSEN since 2008. The Zentralverband Gartenbau (Central Horticultural Association) and Messe Essen jointly call on all exhibitors to submit their innovations. The plants exhibited will be judged by an expert jury. From the assortments of flowering and green indoor plants, spring-flowering plants, bedding and balcony plants, cut flowers, perennials, woody plants and tub plants, the most attractive plant in each category will be 2023" on the opening day, 24 January.





together with the European Nurserystock Association (ENA), invites you to the European Nursery Reception at its stand in Hall 7 for further discussions. In addition, daily tours will be offered on the topics of "Climate Trees" and "Perennials". The starting point for the theme tours is the new Meeting Point in Hall 6 with expert advice and information. Partners are the Association of German Nurseries, the Association of German Perennial Gardeners and the Staudenring.

International Horticultural Forum with partner country Great Britain

The latest news on British horticulture at first hand: the International Horticultural Forum with partner country Great Britain offers the opportunity to do so on Thursday, 26 January, at 2 pm. Under the heading "Quintessentially Green & British", the event will deal, among other things, with sustainability, the value of new plants and the current marginal farm model.

Show your Colours Award

Who has the best marketing story? This is what the Show Your Colours Award is all about, which is jointly organised by IPM ESSEN and BIZZ Communications. The plants submitted and their stories will be exhibited in Hall 8. In addition to a jury of experts, visitors to the fair can also choose their favourite. The award ceremony will take place on Thursday, 26 January, at 3 p.m. at the BIZZ Communications stand in Hall 8.

New: Horticultural Technology Innovation Centre

The Innovation Centre Horticultural Technology in Hall 4 is a forum where trade visitors can expand their knowledge of current and future-

oriented technology topics such as sustainability, gate reduction, automation and energy. The forum is accompanied by an exciting specialist programme with innovative approaches to solutions for challenges within the sector, as well as product and project presentations.

Teaching show "Gardeners can do it!"

For years, horticultural businesses have been caught between numerous demands to meet environmental policy goals and their own demands for the production of natural products from the point of view of resource conservation. The educational show in the Green City in Hall 1A will present a number of starting points and bases for discussion on this subject and the possibilities that horticulture is already using or will use.

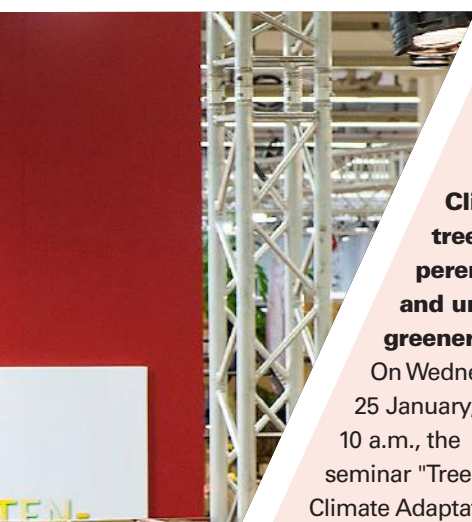
For garden centres and the green trade: IPM Discovery Center

Green stylist Romeo Sommers will present sales-boosting POS concepts at the IPM Discovery Center in Hall 7. Several times a day, interested visitors can take guided tours to find out more about current retail trends and how to inspire tomorrow's customers.

Experience trend floristry

The Association of German Florists invites you to the inspiring FDF World in the Green City, Hall 1A. Top national and international floral designers will meet on the revolving stage and inspire the trade public with floral creations. The numerous product presentations provide new input for a successful business year. Among other things, visitors can look forward to the new "justchrys 2023" collection, which shows practical and creative ideas for the multi-talented chrysanthemum.

There is a lot to discover and try out at the large action and trend stand at the BLOOM's World special show. The range includes event floristry for weddings, natural funeral floristry and creative workshops for visitors to take part in. The blossoming Relax & Talk Area invites you to specialist talks and to exchange ideas with experts.



Climate trees, perennials and urban greenery

On Wednesday, 25 January, from 10 a.m., the seminar "Tree.City. Climate Adaptation" is on the agenda under the auspices of the Association of German Tree Nurseries (BdB) as part of the campaign "More Green Cities for Europe". The event will highlight current experiences in the production, implementation and maintenance of urban greenery, especially urban trees, from three different perspectives. From chosen as the "IPM Novelty 5.30 p.m., the BdB,

GIANTS OF AGRICULTURE HAVE REACHED FOR THE SKY WITH GROWTECH, THE STRATEGIC EXHIBITION OF THE STRATEGIC SECTOR...



Growtech, the world's biggest greenhouse exhibition, brought together 571 exhibitors from 27 countries and 58.555 visitors from 123 countries at Antalya ANFAŞ Expo Center.

The latest technology and innovations in the agricultural sector were showcased at the Growtech, where the number of total and foreign visitors increased by 9 percent compared to the previous year; strong domestic and foreign companies met with international buyers.

Stating that they were excited to bring together the agriculture professionals and the big domestic and foreign companies of the sector at Growtech, which was held for the 21st time, Exhibition Director Engin Er said, "The strength of our country in agriculture, which is one of the leading strategic sectors, and our potential in the global world were once again revealed."

Stating that Growtech, which brings together 571 exhibitors from 27 countries, is the most important trade and marketing organization of the international agriculture sector, He stressed that professional visitors had the opportunity to win more, expand their businesses, technologies, products and services exploring and innovative approaches in the agricultural sector, with the motto of "Meet, Grow, Win".

To the full program of event

Engin Er, "Growtech, the world's biggest greenhouse exhibition; in an area of 60 thousand square meters, it brought together companies with "Greenhouses and Technologies", "Irrigation Systems and Technologies", "Seed", "Plant Nutrition" and "Plant Protection" product groups. We hosted 58.555 visitors from 123 countries



for 4 days. This year, Germany and France exhibit as national pavilion for the first time, while 6 countries with the Netherlands, Spain, France, China and South Korea set up pavilions with national exhibitors." said.

Innovation awards and plant breeding project market

Stating that they host different events at the Growtech, as every year, He said, "Growtech, which



supports innovative works that add value to agricultural production and create sectoral awareness, would be given the ATSO Growtech Agricultural Innovation Awards in cooperation with Antalya Chamber of Commerce and Industry. We held the 6th Plant Breeding Project Market in Antalya Teknokent organization and the "Winning Projects Meet with Angel Investors" events. "Agriculture Talks", which were colored with the

presentations of valuable names in the field and held in cooperation with Mine Ataman, witnessed inspiring exchanges about agricultural technologies and the future of agriculture.

58.555 visitors from 123 countries visited Growtech 2022 in 4 days

A total of 58.555 visitors from 123 countries attended the Growtech 2022, which grows with domestic and foreign visitors and

exhibitors every year.

While 50.448 Turkish visitors visited the Growtech; The number of foreign visitors was 8,107.

In total, the increase in the number of visitors compared to 2021 is 9 percent; The number of foreign visitors also increased by 9 percent. Top 10 countries that visit the expo the most; Iran, Jordan, Egypt, Iraq, Russia, Azerbaijan, Morocco, Uzbekistan, Lebanon and Kazakhstan.

The total number of exhibitor companies reached 571 from 27 countries; 6 countries hosted their visitors in the pavilions as national exhibitors.

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