



# AGRI MECH

(YOUR FARM TECHNOLOGY NAVIGATOR)

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## Leading Agriculture Players Announce Partnerships to Improve Food Security in the Middle East

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# EDITORIAL

## Comments

### Importance of conservation agriculture (CA)

**Mohammad Esmail Asadi, Assistant Professor, senior research scientist of agricultural engineering research department, Golestan agricultural and natural resources research and education center, AREEO Gorgan, Iran.**

Conventional tillage (CT) is the main cause of soil disturbance and land degradation. In the minds of many, a freshly tilled field means it's ready for the next planting. But soil scientists can prove that CT generally isn't good. When soil is tilled, the top 20 centimeters of the soil is often disturbed and even inverted. The plowing and disking implements often make a compaction zone in the soil at the lower depth of the implement, which limits root growth and water infiltration. Disturbances such as CT introduce an abundance of oxygen to the soil that accelerates the action of bacteria that process organic matter. This leads to rapid oxidation of organic matter (OM) and an overall loss of OM in the soil as it is decayed and released into the atmosphere as carbon dioxide (CO<sub>2</sub>). Removing CT and minimizing disturbance allows the fungal, micro-arthropod, protozoa, nematode and earthworm populations to come into balance with their environment and produce a more diverse biological community. The promising paradigm in response to CT and land degradation concerns is a different agriculture paradigm known as conservation agriculture (CA). Processing of OM becomes more consistent throughout the year with CA practices and OM levels will actually begin to increase. Promoting CA-farming practices that involve minimal soil disturbance, permanent soil cover and the use of crop rotation to simultaneously maintain and boost yields, increase profits and protect the environment – is a keystone of pioneers farmers current strategy to conserve water and make farming more sustainable. These practices reduce costs for farmers – especially by saving fuel for the soil tillage – increase soil quality, reduce soil erosion and improve biological activity, all while increasing agricultural productivity, especially by increasing resilience to drought. Unplowed fields that retain crop residues are better at capturing and holding moisture, often raising yields with less water.

According to Prof. Amir Kassam, moderator of the FAO-hosted global platform for CA community of practice (CA-CoP) since 2008/09, CA systems have been spreading globally in all continents at the combined annual rate of 10 M ha. In 2008/09, CA covered some 107 M ha of annual rainfed and irrigated cropland, corresponding to 7.4 % of global annual cropland, and in 2013/14 it covered some 160 M ha of annual cropland, corresponding to about 11% of global annual cropland. In 2015/16, CA covered more than 180 M ha of annual cropland, corresponding to 12.5% of global annual cropland. Some 50% of CA land is in the low income countries, particularly in Latin America and Asia, and during the last decade it has begun to spread in west and central Asia and in Africa as farmers and their communities learn how to overcome constraints to adoption of CA.

Farmers who adapted CA approach understand that tillage, the turning of the soil that has been the standard for growing crops for years and years, is disruptive to soil microbes and destructive to the soil system and its very structure. Instead, they disturb the soil as little as possible, generally using specially designed planters that can sow seed into unplowed soils, even though crop residues. CA farmers grow a diversity of living plants in the soil as much of the time as practical, covering the soil and offering food to soil microbes through living roots. Those soil organisms, in turn, cycle nutrients back to the plant, allowing it to grow and flourish.

Sustainable agriculture is the strategy to follow if we are to increase production while maintaining our natural resources base. To make this vision a reality, continued investment in CA cropping systems and other sustainable strategies will be necessary to mitigate agricultural water crisis, adapt to new climates and be resilient against other political and environmental shocks. Investing in farmer learning process for adoption of CA will be required as well. CA requires good timing of operations and excellent adjustments of the planters to match the soil conditions. Successful CA is knowledge intensive.

**Mohammad Esmail Asadi**

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## Technology

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Expected to attract at least 1,000 farmers, head of cooperatives, dealers and distributors a day, the National Farmers Forum features key speakers including Dr. Wiwat Salyakamthorn, Deputy Minister, MOAC.



## Technology

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With the right focus from various stakeholders, farm mechanization has the potential to play a significant role in decreasing labour drudgery and intensiveness and increasing efficiency in farm operations.

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# AUTONOMOUS FARM EQUIPMENT MARKET IN INDIA

**A**griculture is one amongst the most overbearing industry since the beginning of human civilization. Constant growth in population, increasing need for food, fuel and feed is anticipated to influence trifold of the present-day cultivation. For this purpose, strategies such as initiation of autonomous farming and mechanization are adopted on a larger basis for yielding more from the constrained arable land. Increasing labor shortage and changing trends for the use of autonomous equipment are driving the demand for autonomous farm equipment.

Development of IoT along with GPS systems application has transformed the agriculture industry. High cost essential for the improvement of the equipment performance is likely to affect the product penetration. However, industry players are working towards reducing the total cost by making it affordable, which ultimately will increase the product penetration. Moreover, the equipment provides less downtime and can be utilized even during night as well as extreme fog condition. Autonomous farm equipment provides with outstanding fuel efficiency, compared to standard counterparts and has less chances for errors. Variable climatic conditions and challenges like water shortage are dealt with the help of these equipment.

Autonomous farm equipment can be defined as the

equipment which do not require any human operator to be onboard the machine to operate it. The farm equipment can be partial autonomous or fully autonomous which offer much more features than the conventional auto-steer systems. Autonomous farm equipment aid the cultivators to perform better job and increase their productivity. The autonomous equipment offers a complete solution to issues such as limited working hours, manual labor, detection of mechanical or operational failure and optimum handling of operations with very limited supervision from a human operator.

All the aforementioned factors help in reducing a lot of time and cost involved with the conventional farm equipment thus, making autonomous farm equipment a better choice for farming operations. Autonomous farm equipment is one of the most anticipated technology in the field of mechanized farming. The technology has been evolving continuously and manufacturers are engaged in introducing new and improved versions of the autonomous equipment.

The use of advanced electronics, robotics and satellite location systems for guidance and navigation has enhanced the capabilities of modern day farm equipment. This allows the operator to perform tasks related to the field without actually boarding the equipment or even stay present at the farm. Factors such







as high cost of autonomous systems, lack of awareness accompanied with higher availability of cheap labor in the developing regions of Asia Pacific and Latin America pose hindrances in the blooming of the overall autonomous farm equipment.

Growth in start-ups focusing majorly on the implementation of robotics in agriculture owing to increasing productivity and reduction in operation cost. Huge adoption of farm machinery guidance systems in tractors, UAV and harvesters will primarily drive the industry growth. Industry players are constantly focusing on increasing the penetration of tractors with autosteering applications. Farmers and contractors are constantly focusing on cost-effective solution and increase the agricultural yield. Application of GPS systems along with development of IoT has revolutionized the agriculture industry. High cost required for the product may affect the product penetration. Moreover, additional training required for the usage of the product may act as challenge to the industry demand. Industry players are focusing on reducing the overall cost making it affordable and thus increasing the product penetration.

Proliferation in startups focusing majorly on robotics applications in agriculture and reduction of overall operational cost of agricultural process and increasing yield will enhance product usage in the industry. Further, the device can operate in extreme weather conditions reducing the operating time and boosting profitability. Farmers and contractors are focusing of implementation of cost effective solutions that boosts farm yield.

The Indian Government aims for 'one nation, one market' and the same applies to the agriculture sector where the focus is on expanding the market reach for farmers to national level rather than be restricted to a local or state level market. The GST regime implemented on 1st July,

2017 is one hope to achieve this. Elimination of state level taxes will make inter-state trade of food products easier and also help to reduce transactions costs associated with their transport. The National Democratic Alliance (NDA) government is working on creating a common agricultural market and in April, the government put out a model law proposing a change in the way agricultural markets such as local markets and the state Agricultural Produce Marketing Committee (APMC) markets, operate. It proposes to replace existing fragmented and over-regulated markets for agricultural produce and allow farmers to reach national markets.

The Indian government remains committed towards rural development and agriculture mechanization. Government invites global businesses to invest in India. In agriculture, his emphasis is on the opportunities in increasing yield through technological intervention, organic farming and value addition through food processing. Agriculture is one of the strongest pillars for the economic growth of the country and revolutionising agriculture is imperative to meet the aim of achieving 8%+ economic growth in the coming years. Though India has achieved much advancement, there is still much more scope for improvement to compete in the global markets.

Implementation of driverless tractors, harvesters and UAV offering smooth functioning and precise data collection will fuel the autonomous farm equipment market. High cost of the product may act as challenge to its demand. Additionally, the requirement of training for proper functioning of the devices may affect the product usage. Manufacturers are focusing on reducing cost of the equipment making it affordable to the customers.

Fully autonomous segment will depict strong growth of over 40% over the forecast timeline. Implementation of systems such as precision farming and GPS, offering remote monitoring of the devices and avoiding obstacles







will further support the industry demand.

Autonomous mobile robots are causing a paradigm shift in the way we envisage commercial and industrial vehicles. In traditional thinking bigger is often better. This is because bigger vehicles are faster and are thus more productive. This thinking holds true so long as each vehicle requires a human driver. The rise of autonomous mobility is however upending this long-established notion: fleets of small slow robots will replace or complement large fast manned vehicles.

These robots appear like strange creatures at first: they are small, slow, and lightweight. They therefore are less

productive on a per unit basis than traditional vehicles. The key to success however lies in fleet operation. This is because the absence of a driver per vehicle enables remote fleet operation. Our model suggests that there is a very achievable operator-to-fleet-size ratio at which such agrobots become commercially attractive in the medium term.

Partially autonomous contribute the major volume share of the industry owing to implementation of the systems at competitive prices and commercialization of the products. In addition, increasing awareness of the product particularly in emerging countries for various agricultural processes will support the business demand.

Tractors capture the major revenue share and is expected to continue its dominance over the forecast timeline owing to its wide usage in agricultural sector. Constant operating capability of these vehicles with higher ROI factors will positively influence the autonomous farm equipment market penetration. Harvesters will showcase significant growth over the coming years. Continuous development in robotics along with availability of the product at competitive price are the key factor for industry growth. In addition, guidance systems in the harvesters used for automatic steering offering superior performance using





optimal path and reducing the risk of overlap are highly preferred by the customers.

Implements predominantly perform a purely mechanical functional today. There are some notable exceptions, particularly in organic farming. Here, implements are equipped with simple row-following vision technology, enabling them to actively and precisely follow rows. This is however changing as robotic implements become highly intelligent. Indeed, early versions essentially integrated

multiple computers onto the implement. These are today used for advanced vision technology enabled by machine learning (e.g. deep learning).

Here, the intelligent implements learn to distinguish between crops and weeds as the implement is pulled along the field, enabling them to take site-specific weeding action. We anticipate that such implements will become increasingly common in the future. They are currently still in their early generations where the software is still learning, and the hardware is custom built and ruggedized by small firms. Recent activities including acquisitions by major firms suggest that this is changing.

Despite non-fresh fruit harvesting being largely mechanized, fresh fruit picking has remained mostly out of the reach of machines or robots. Picking is currently done using manual labour with machines at most playing the part of an aid that speeds up the manual work. A limited number of fresh strawberry harvesters are already being commercially trialled and some are transitioning into commercial mode. Some versions require the farm layout to be changed and the strawberry to be trained to help the vision system identify a commercially-acceptable percentage of strawberries. Others are developing a more







universal solution compatible with all varieties of strawberry farms. Progress in fruit picking in orchards has been slower. This is because it is still a technically challenging task: the vision system needs to detect fruits inside a complex canopy whilst robotic arms need to rapidly, economically and gently pick the fruit. This is however beginning to change, albeit slowly. Novel end effectors including those based on soft robotics that passively adapt to the fruit's shape, improved grasping algorithms underpinned by learning processes, low-cost

good-enough robotic arms working in parallel, and better vision systems are all helping push this technology towards commercial viability.

Industry players are focusing on reducing the overall cost of the software and improving the compatibility with the equipment. Moreover, continuous development in the software boosting the precision of the product will further support the autonomous farm equipment industry growth. Hardware dominates the overall autonomous farm equipment market revenue share, accounting around 95% owing to increasing advancement of the product. In addition, easy operation of the device for various agricultural process requiring higher capacity will positively influence the product penetration.

Autonomous farm equipment penetration is boosting owing to shifting consumer preference towards higher yield and cost-effective solutions. In addition to this, the product offers less downtime as these can be used during night and under higher fog condition. Autonomous farm equipment offers superior fuel efficiency as compared to conventional counterparts with reduced chances of errors. Increasing climate changes and challenges such as water shortage are easily addressed by the usage of these devices. ■■■





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# Soil Moisture Sensor: Smart AGRICULTURE TECHNIQUE

**W**ater is a very precious resource and a driving force in irrigation. Optimal use of water is a need of the hour. Efficient irrigation watering helps in saving water, getting better plant yields, reduce dependency on fertilizers and improve crop quality. Various methods, both laboratory and field including remote sensing are available to measure soil moisture content, but the quickest and better one is with the use of soil moisture sensor electronic devices. For successful irrigation, it is necessary to monitor soil moisture content continuously in the irrigation fields. The selection of soil moisture probes is an important criterion in measuring soil moisture as different soil moisture sensors have their own advantages and disadvantages. The soil moisture sensors are used intensively at present because it gives real time readings. An attempt is made in this article to review some of the sensors available, their specifications, properties, applicability, advantages and disadvantages so that an informed decision on selection of appropriate sensor can be made for a particular application.

As the world is trending into new technologies and implementations it is a necessary goal to trend up in



agriculture also. Many researches are done in the field of agriculture. Most projects signify the use of wireless sensor network collect data from different sensors deployed at various nodes and send it through the wireless protocol. The collected data provide the information about the various environmental factors. Monitoring the environmental factors is not the





complete solution to increase the yield of crops.

There are number of other factors that decrease the productivity to a greater extent. Hence automation must be implemented in agriculture to overcome these problems. So, in order to provide solution to all such problems, it is necessary to develop an integrated system which will take care of all factors affecting the productivity in every stage. But complete automation in agriculture is not achieved due to various issues. Though it is implemented in the research level it is not given to the farmers as a product to get benefitted from the resources. Hence this paper deals about developing smart agriculture using IoT and given to the farmers.

The world, at present is facing shortage of water which is hampering the development of agriculture and hence the food production. Judicious use of water is therefore necessary and in agriculture particularly, optimum use of water is necessary as there is shortage of water in most parts of India. Soil moisture is primary information in achieving optimum water requirements for the crops. As the water infiltrates into the soil, the pore spaces are filled with water and water starts percolating downwards. As this process continues, the soil attains field capacity but the percolation of water continues due to capillary action and gravity. When soil water exceeds the field capacity, the excess water drains out (saturation point).

Have you ever wanted your plants to tell you when they need watered? Or know how saturated the soil in your garden is? The present project proposes an IoT enabled smart soil moisture monitoring system that helps the government authorities to know the information about dry soil areas in the agricultural lands within a village, town or even a state so that the necessary precautionary steps can be taken to make such lands fertile. Besides, the project is also very much useful for the farmers, organizations or individuals running plant



nurseries to automatically turn the pumping motor ON and OFF on sensing the moisture content of the soil. The advantage of using this method is to reduce human intervention and still ensure proper irrigation.

Soil moisture is a key variable in the climate system. By controlling evapotranspiration, soil moisture impacts the partitioning of incoming radiation into sensible and latent heat flux. Furthermore, it represents an important water and energy storage component of the regional climate system. Soil moisture sensors are used for measuring the water content of soil. Multiple soil







moisture sensors are combined to form a soil moisture probe. Frequency domain sensors such as a capacitance sensor are the most common sensor that is being widely used for commercial purposes. Inexpensive sensors consisting of two electrodes and probes for measuring the soil resistance are often used for residential purposes.

A soil moisture sensor (SMS) was built around a RISC-like microcontroller and common peripherals to perform data acquisition signal processing, configuration, fault-detection and data communication

with control/management systems. The SMS employs capacitance and heat-pulse techniques to determine the soil water content. The sensor uses the capacitance technique as the main method while the heat-pulse readings, acquired at a lower rate, are used for calibration and fault detection purposes. The temperature sensors and the heater were assembled in a four-needle probe. Several experiments were conducted for different types of soil. The results showed that this sensor could be applied in an effective way to measure the soil water content. Several tests are being performed to conclude about the sensor dependence with soil temperature and chemical composition as well about its long-term stability.

Time domain reflectometry (TDR) and time domain transmission (TDT) are also used for measuring the soil moisture content. A higher average dielectric constant for the soil is caused by a higher water concentration. The soil moisture sensors measure the propagation speed in a buried transmission line to measure the average dielectric constant. These sensors provide real-time data and improve the irrigation efficiency. The sensors are easy to install and require very less maintenance.

In the agricultural field, it is essential to determine the soil water content for assessing the profitability and viability of the business. It is also critical to restrict the usage of water with the increasing needs and cost of water. However, the soil moisture data corresponding to the surface of the soil can be acquired with the





currently available novel technologies. There is a need for new technologies to collect data on sub-surface water measurements with the ever-increasing demand on water resources.

Among the widely used automated soil moisture measurement techniques are neutron scattering, gamma ray attenuation, soil electrical conductivity (including electrical conductivity probes, electrical resistance blocks and electromagnetic induction), densitometry, hygrometry (including electrical resistance, capacitance, piezoelectric sorption, infrared absorption and transmission, dimensionally varying element, dew point, and psychrometric), and soil dielectric constant (including capacitance and time domain reflectometry). While there is a wide range of point soil moisture measurement techniques commercially available for monitoring of soil moisture content, and each of the techniques have been evaluated using the standard thermo gravimetric technique, there has been little in the way of quantitative inter-comparison between the various techniques, or evaluation under field conditions.

Moreover, energy fluxes present at the atmospheric interface or land surface and water exchange processes are highly impacted by surface soil moisture. Hence accurate measurement of temporal and spatial variations of soil moisture is required for several environmental studies. Recent advancements in satellite remote sensing technology have proved that



various remote sensing techniques are suitable for measuring soil moisture.

Irrigation management is a practical application of monitoring soil moisture that is becoming widespread among agricultural growers. Soil moisture-based optimized irrigation consists of keeping the soil within a target moisture range by replenishing the plant water uptake with irrigation. This practice reduces the potential for soil water excess and leaching of agrochemicals present in the soil, however it requires selection of a suitable method for soil moisture. The increasing worldwide shortages of water are leading to an emphasis on developing methods of irrigation that minimize water use. Development of precision irrigation method such as variable irrigation system is





able to deliver proper rates of water to different soil types and hence improve water and energy use. Such system also requires proper irrigation scheduling techniques to maximize its capability. The purpose of irrigation scheduling is to determine the amount of water to apply to the field and the timing for application. Irrigation scheduling methods are either based on soil moisture content soil water balance or check book method or plants response to water deficit.

The soil water balance or check book method computes the change in moisture by comparing the difference of input (rainfall and irrigation) and output (evapotranspiration, runoff, and drainage). Such method is able to indicate the amount of water needed but it is not as accurate as irrigation scheduling based on soil moisture sensor readings. The soil water balance method requires calibration (actual soil moisture measurement) from time to time, due to cumulative error may occur over time.

To monitor soil water content dynamically in the farmland, a sensor technique, which has high accuracy and rapid response, low energy consumption and cost, is desired. In early times, techniques for this purpose were a plaster sensor and densitometer, but their response was unsatisfactory and there was hysteresis error between wetting and drying. A more rapid response can be achieved by FD sensor, which only needs a fraction of a second. However, there still have two technique limitations: 1) Underground power supply cables are impractical under large farmland areas, and the life of batteries is limited. The energy consumption, environmental and human labour costs required to change batteries regularly for a soil moisture sensor network to be used in an irrigation system are prohibitive. Providing a stable and lasting

energy supplement for sensors by solar power must be considered. 2) Because the sensor output signals transmitted by long-distance cables are unrealistic in a farmland environment, so another limitation is to wirelessly transfer the data with data-loggers or routers across a certain distance.

In the agricultural field, it is essential to determine the soil water content for assessing the profitability and viability of the business. It is also critical to restrict the usage of water with the increasing needs and cost of water. However, the soil moisture data corresponding to the surface of the soil can be acquired with the currently available novel technologies. There is a need for new technologies to collect data on sub-surface water measurements with the ever-increasing demand on water resources.

Moreover, energy fluxes present at the atmospheric interface or land surface and water exchange processes are highly impacted by surface soil moisture. Hence accurate measurement of temporal and spatial variations of soil moisture is required for several environmental studies. Recent advancements in satellite remote sensing technology have proved that various remote sensing techniques are suitable for measuring soil moisture. Thus, this system avoids over irrigation, under irrigation, top soil erosion and reduce the wastage of water. The main advantage is that the system's action can be changed according to the situation (crops, weather conditions, soil etc.). By implementing this system, agricultural, horticultural lands, parks, gardens, golf courses can be irrigated. Thus, this system is cheaper and efficient when compared to other type of automation system. In large scale applications, high sensitivity sensors can be implemented for large areas of agricultural lands.■■■





# हर किसान का सपना गोबिन्द रोटोवेटर हो अपना

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# The possibilities of Internet of Things (IoT) for Agriculture

The Agricultural revolution of 1930s to 1960s focused on increasing agricultural production and mechanization; technology was at the centre of its success. However, in reality 50 years later, there are still many people who are hungry, today 815 million people are chronically undernourished. For farmers and growers, the Internet of Things has opened up extremely productive ways to cultivate soil and raise livestock with the use of cheap, easy-to-install sensors and an abundance of insightful data they offer.

Prospering on this prolific build-up of the Internet of Things in agriculture, smart farming applications are gaining ground with the promise to deliver 24/7 visibility into soil and crop health, machinery in use, storage conditions, animal behaviour, and energy consumption level. It is a trend to use information technology to lead the development of modern agriculture. According to FAO, the world will need to produce 70% more food in 2050 than it did in 2006 in order to feed the growing population of the Earth.

To meet this demand, farmers and agricultural companies are turning to the Internet of Things for analytics and greater production capabilities. The IoT refers to the rapidly growing network of connected objects that are able to collect and exchange data using



embedded sensors. The IoT is set to push the future of farming to the next level. IoT technology integrates a variety of technologies such as sensor, automation, telecommunications, computer, RFID, with Bio-systems engineering, agricultural machinery, food science, agricultural products supply chain management, animal, soil and plant sciences, IoT will touch many more







industries than just agriculture, but I am interested on some real world examples of IoT in agriculture and find potential collaborations and helps. Internet of Things (IoT) is already a mainstream phenomenon, being driven by the promise of revenue growth across multiple sectors such as manufacturing, transportation, resource extraction, agriculture, and the military.

The agriculture industry, in particular, primarily depends on engineering, technology as well as the biological and physical sciences. In this digital era, the agriculture industry has been an enthusiastic adopter of IoT and the applications of IoT in this sector is proliferating at a lightning speed with big farmhouses having to rethink their methods to find the efficiencies and cost savings necessary to compete. With the real-time data provided, it can be possible for farmers to work in the acres of land and still watch their assets across entities such as their field, machinery and finance, monitored without being physically present. IoT, combined with big data, further provides farmers with a wealth of information that they can use to optimise efficiency, maximise productivity and

maintain the quality of food in the supply chain - from field to fork.

Initiatives to modernise agriculture have already been undertaken by developing IoT systems that enhance livestock welfare, these systems use data collected from a variety of sensors to ensure all operations are being executed within a set parameter and alerting farmers of any issues. For instance, when using IoT to monitor the health of livestock remotely, the farmers can track the animals' movement to establish grazing patterns and help increase yield.

IoT is all about connectivity. In our case, that means not only the machines but the farmers using our app on their mobile devices. Data from the sensors on a harvesting machine is sent automatically to the cloud. The goal is to make farming more efficient and productive to feed the world of the future. There will be 10 billion people by 2050. To feed them all, we need to double grain production. The growing middle class in emerging markets want to eat more meat, and to produce one pound of meat, you need five to seven pounds of grain. With precision agriculture, farmers work smarter not harder. The precision part means they can manage large fields as if they are a group of small fields, monitoring soil at closer intervals, and tailoring the growing conditions to each small area for best results. Or, in other words, they extract as much value from each seed as possible.

The World Economic Forum IoT report agrees that precision agriculture leads the evolution to outcome-based services. When farm equipment is connected to geo-location data, farmers can coordinate and optimize





farm production in new ways. For example, automated tillers can inject nitrogen fertilizer at precise depths and intervals, as seeders follow, placing corn seeds directly in the fertilized soil. Of course, many companies are trying to provide agricultural solutions and IoT connected devices and platforms.

According to the U.S. Department of Agriculture, over 60 percent of U.S. agricultural input dealers offer some kind of variable-rate-technology services. However, less than 20 percent of acreage is managed using these technologies due to the high cost. Ideally, as the benefits of precision agriculture become more well-known, the use of the technology will become more widespread, and the costs will decrease. New innovative IoT applications are addressing these issues and increasing the quality, quantity, sustainability and cost effectiveness of agricultural production.

Today's large and local farms can, for example, leverage IoT to remotely monitor sensors that can detect soil moisture, crop growth and livestock feed levels, remotely manage and control their smart connected harvesters and irrigation equipment, and utilize artificial

intelligence based analytics to quickly analyze operational data combined with 3rd party information, such as weather services, to provide new insights and improve decision making.

But, as the technology driving the internet of things continues to develop, lowering in cost and spreading in accessibility, exciting new precision agricultural techniques are enabling farming operation of all sizes to leverage data insight and realize efficiencies that materially increase yields while optimizing resource allocation and costs. Technological development follows no physical or invisible boundaries and expands its roots in all directions. Likewise, the Internet of Things has its applications in fields of home security, Industry (as Industrial Internet of Things) and smart cities. But technological development within the Internet of Things has even sown its seeds in the agricultural sector, leading to the Agricultural Internet of Things. With over 20 billion internet-connected devices expected to run by 2020, the deluge of data streams from these devices would warrant the use of edge computing, sophisticated analytics and AI.



Innovative interplay of such technologies to produce desirable use cases is egging on the growth of Internet of Things (IoT) today. Globally, countries are fast-adopting IoT in spaces such as retail, consumer wearable, commerce and smart infrastructure. Currently a relatively small market for IoT, India aims to clinch at least 20 percent market share in the next 5 years. The Indian government's efforts in modelling a 'Digital India' highlight the indispensable role of IoT and cloud technologies to usher in a digital revolution for growth in India.

In fact, the IoT revolution in India is already catching on with increasing government and venture capital investments pouring into supporting start-ups working on real-use cases addressing unique challenges like traffic management, surveillance and safety, smart homes in urban settings and so on. While urban infrastructure development forms an obvious area for IoT implementation, it is interesting to evaluate the impact of IoT and rural technologies on penetration of welfare services in rural areas that house 70 percent of the country's population, as per the Census of India's 2011 Provisional Population Totals of Rural-Urban Distribution. For example, the government's 'Tele-medicine' network for e-healthcare services delivery is transforming accessibility in remote parts of the country. The system allows for doctor-patient interaction in telemedicine centres, with patients' health records being automatically wired to doctors for reference.

The IoT is expected to be a powerful driver that will transform agriculture and food into smart webs of connected objects that are context-sensitive and can be identified, sensed and controlled remotely. This is expected to change agri-food processes in unprecedented ways, resulting in new control mechanisms and new business models. As such, we believe that IoT will be a real game changer in agriculture and the overall food chain that drastically improves productivity and sustainability. For example, IoT will help farmers to change towards data-driven farming supported by decision-making tools with timely and accurate operational data.

As a result, farms can depart from the traditional supply-oriented, cost price driven, anonymous approach to a value-based, information-rich approach in which demand and supply continuously are matched. Ultimately, farms and food supply chains can become self-adaptive systems in which smart, autonomous objects, including farm equipment, can operate, decide and even learn without on-site or remote intervention by humans.

In IoT-based smart farming, a system is built for monitoring the crop field with the help of sensors (light, humidity, temperature, soil moisture, etc.) and automating the irrigation system. The farmers can monitor the field conditions from anywhere. IoT-based smart farming is highly efficient when compared with the conventional approach. The applications of IoT-





based smart farming not only target conventional, large farming operations, but could also be new levers to uplift other growing or common trends in agricultural like organic farming, family farming (complex or small spaces, particular cattle and/or cultures, preservation of particular or high quality varieties etc.), and enhance highly transparent farming. The adoption of access to high-speed internet, mobile devices, and reliable, low-cost satellites (for imagery and positioning) by the manufacturer are few key technologies characterizing the precision agriculture trend.

Greenhouse farming is a methodology that helps in enhancing the yield of vegetables, fruits, crops etc. Greenhouses control the environmental parameters through manual intervention or a proportional control mechanism. As manual intervention results in production loss, energy loss, and labour cost, these methods are less effective. A smart greenhouse can be designed with the help of IoT; this design intelligently monitors as well as controls the climate, eliminating the need for manual intervention. For controlling the

environment in a smart greenhouse, different sensors that measure the environmental parameters according to the plant requirement are used. We can create a cloud server for remotely accessing the system when it is connected using IoT.

This eliminates the need for constant manual monitoring. Inside the greenhouse, the cloud server also enables data processing and applies a control action. This design provides cost-effective and optimal solutions to the farmers with minimal manual intervention.

Now it is the day of telling everything is possible which is made possible by 'Internet of Things' which connects everything on the earth together via internet. It will collect or capture the many massive data and is considered as useful and valuable information. Data mining is important thing for making it as smart system, to provide convenient services and environments. Efficient water management techniques are required for increasing yield of any crop that requires estimating crop water requirements in a reliable manner and realistic manner. Evapotranspiration is an essential component of the hydrological circle and its accurate estimation is necessary for many hydrological studies.

A wireless sensor Networks (WSN) provides a simple cost effective solution to monitor and control, the sensor nodes have several external sensors namely leaf wetness, soil moisture, soil pH, atmospheric pressure sensors attached to it. Based on the value of soil moisture sensor the mote triggers the water sprinkler during the period of water scarcity. Cyber Physical systems (CPS) will play an important role in the field of precision agriculture and it is expected to improve productivity in order to feed the world and prevent starvation, Precision agriculture is already adopted in other countries, but we still need to involve IOT and cloud computing technologies for better production of crops.■■■





# Leading Agriculture Players Announce Partnerships to Improve Food Security in the Middle East

**AgraME**  
6 - 8 March 2018  
Dubai World Trade Centre, UAE

*Industry hails 15<sup>th</sup> edition of AgraME as 'perfect platform' for amplifying their products, solutions and partnerships to improve food security in the Middle East and Africa.*

In socialist countries agricultural exhibitions serve the interests of the whole state and all the people. Their purpose is to accelerate the development of agriculture in the technical, technological, and organizational aspects on the basis of introducing the achievements of agricultural science and progressive practice into production. Agricultural exhibition is one of the methods to deliver the innovation or new information to the farmer. By this method of delivering, it can increase the desire of farmer to know about the innovation. When farmers can understand their needs through certain innovation, then farmers can empower themselves to increase knowledge and understanding and also embellish their skill. It means agricultural exhibition have a role as a bridging on empowering farmers

AgraME is the regions' one of the most established and dedicated trade and business events for the agriculture, poultry and livestock industry. Celebrating 10 years serving the agricultural industry in the Middle East,



those that know the market here exhibit at AgraME. Over 90% of the local exhibitors take part every year as the





exhibitions over 7000 visitors from almost 100 countries. All 3 days were buzzing with buyers witnessing over 850 innovative products from local and international companies with many of them conducting exclusive launches. AgraME is also one of the only exhibitions in the industry with the official endorsement of the Ministry of Environment and Water. Officially inaugurated by His Excellency Sheikh Dr. Majid Sultan Al Qassimi, Acting Assistant Undersecretary for Food Diversity Sector and Director of Animal Development & Health Department at the Ministry of Climate Change and Environment, AgraME, the region's only event dedicated to the full value chain of agribusiness, aquaculture and animal health, recently concluded its latest edition at the Dubai World Trade Centre. Government Ministers, C- Level industry professionals, investors, farmers, veterinarians and suppliers spanning 90 countries, assembled over three days to network, trade, share knowledge and set the agenda for the future



of the agriculture sector. A key theme that ran throughout the event this year was a number of trade announcements made from regional investment body AAAID, Agthia Group and global heavy machinery player, Massey Ferguson.

AgraME, for the first time ever, hosted 40 businesses of the 'AAAID's Affiliate Company Programme' who attended the conference - in addition to AAAID's strategic partners. Business meetings were held between companies that discovered ongoing areas of cooperation between in the field of Agriculture Business. To kick off day two's conference agenda, a total of six agreements and Memorandum of Understandings were signed in the presence AAAID Chairman H.E Mohammed Bin Obaid Al Mazrooei, and H.E Mariam AlMheiri, Minister of State who is responsible for future food security and other key industry figures.



Some of the companies to sign MoU's onsite included the Arab Company for Drugs Ltd, Emirates Modern Poultry Co. and Al Rawabi Dairy Company.

Agthia, one of the UAE's leading food and beverage companies in the UAE, also announced that it had entered an innovation and technology partnership agreement with Trouw Nutrition Hifeed, a Nutreco Company and global leader in animal nutrition and aquafeed. The deal aims to develop a portfolio of products and services for optimised nutrition, enhanced animal performance and improved economic efficiency in poultry and ruminants.

The partnership decision was signed on the opening day of AgraME, and was attended by H.E Dr Thani bin Ahmed Al Zeyoudi, Minister of Climate Change and Environment, Mr. Otto Seijler, Managing Director of Trouw Nutrition Hifeed and Eng. Tariq Ahmed Al





Wahedi, CEO Agthia Group, among others. Samantha Bleasby, Exhibition Director for AgraME, said: “AgraME continues to evolve and grow year-on-year and

this year’s edition was no different. It was a great indicator of how rapidly the region’s agriculture industry is growing and developing, and the high level of partnership announcements from exhibitors, governments and national organisations further strengthens the show’s reputation as the place to be for anyone connected with the agriculture, aquaculture and animal health industries.”

Kanoo Machinery, a member of The Kanoo Group and one of the exclusive dealers of world-class brands in the Middle East, was a key exhibitor of the newly revamped Crop Farming show vertical at this year’s event and was showcasing brands and technologies such as Massey Ferguson, Bobcat, and Snorkel.

Graeme de Villiers, acting country manager for Kanoo Machinery in the UAE, commented; “Gatherings such as AgraME provides us with an environment and opportunity to highlight our cutting-edge products and services that offer the most efficient and dependable operation for wide-ranging farming needs.”

“We represent global brands associated with constant innovation and related to technology, highly engineered for precision,” he added.



Speaking on the sidelines of day one, H.E. Sheikh Dr. Al Qassimi, who also opened the day one aquaculture conference, commented: "AgraME is the perfect example for how the UAE has been connecting people to meet the continuous demand for new products and technologies that will help us achieve this sustainability. Due to its success, it is now one of the longest running exhibitions in the Middle East covering the four key sectors of Agriculture, Animal Health, Crop Farming and Aquaculture. The exhibition has a great importance in relation to food security, overcoming climate change impact and our over exploited natural resources." In addition to the exhibition the show included three dedicated conference streams - Aquaculture, Animal Health and the AAAID Company Meeting. Covering a range of hot industry topics, with Animal Health being accredited by Continuing Professional Development, the

workshops and seminars provided attendees with the latest insights and understanding of latest technologies, techniques and processes redefining the sector. With all of these technologies on display we got to see anything and everything related to agriculture and livestock, that too just under one roof, without having to visit multiple places and outlets. We even found some of the rare utilities and products on offer at the exhibition, which we were finding difficult to source from the market. Agricultural Exhibition is a modern form of non formal education; it could be a better way to gather the small, medium, large and progressive farmers for agricultural education through, verbal and non verbal techniques. It might ad-lib their interest in modern agricultural methods. ■■■







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# Dhanuka Agritech and FICCI comes together to promote sustainable use of water



**D**hanuka Agritech Limited is the umbrella company for the business of agro-chemicals, fertilizers, and seeds of Dhanuka Group. The company reaches out to more than 10 million farmers with its eco-friendly high quality crop care products.

The Agri-Division has a pan-India presence through its marketing offices in all major states in India. With a dealer network of 15,000 across India, the group has been able to make Dhanuka the preferred choice of farmers. Dhanuka Group has taken up a number of community welfare programs like Dhanuka Ashram at Vrindavan (U.P) for the benefit of pilgrims, Dhanuka Adarsh Vidya Mandir at Ratangarh (Rajasthan) for the less privileged students as well as Scholarships for promising Agri students.

It has 4 modern manufacturing facilities at Gurgaon and Sohna in Haryana, Sanand in Gujarat and Udhampur in J&K for formulation of various grades of pesticides, fungicides, miticides, weedicides, plant growth stimulants, plant growth regulators, foliar fertilizers and sticking agents. It also has 2 Seed Processing Units at Mandideep in M.P. and Turkapalli (Hyderabad) in Andhra Pradesh.

Growing population and urbanization, combined with fast increasing developmental needs, have put a tremendous pressure, on our water availability, especially for crop production. With a population of over 1.21 billion people, which is about 18% of the world's population, with 4% of the total usable water and 2.3% of the arable land available in the world, we face multi-dimensional challenges which are going to be further compounded, due to the impending climate change. The agricultural sector is the biggest user of water, followed by the domestic sector and the industrial sector. Groundwater contributes to around 65% of the country's total water demand, and plays an important role in shaping the nation's economic and social development. Food, water and energy are important inputs and are more or less inseparable, as can be seen from recent events like droughts, oil-spills and increasing food prices.

On the occasion of World Water Day, Dhanuka Agritech

Limited, India's leading Agrochemicals Company in association with Federation of Indian Chamber of Commerce and Industry (FICCI) organized summit on water conservation. The summit aimed to promote sustainable use of water in agriculture and other economic activities. **Shri Nitin Gadkari**, Minister for Road, Transport & Highways, Shipping and Water Resources, River Development and Ganga; **Mr. Arjun Ram Meghwal**, Minister of State for Parliamentary Affairs and Water Resource, River Development & Ganga Rejuvenation; Padma Bhushan **Dr R. B. Singh** along with other noted dignitaries addressed the summit and discussed about rain water harvesting and modern



irrigation techniques which will help in increasing farmers yield.

Water is an important resource for everyone, especially for the farming sector. It, however, is depleting due to excessive wastage. According to a research, 70% of rainwater is wasted and only 30% is saved. Recognizing the impending scarcity of water nearly a decade ago, Dhanuka Agritech is educating and spreading awareness on water conservation through its flagship campaign "*Khet ka pani khet mein aur gaon ka pani gaon mein*". An extension of this campaign was a 60 second film featuring Amitabh Bachchan, created by Ogilvy & Mather which aptly depicts the dependence of Indian populace on rains and the associated happiness and prosperity stating "*Insaan paani bana toh nahi sakta par bacha*





zaroor sakta hai.” The company celebrates World Water Day every year in partnership with prestigious National Institutes & State Agricultural Universities.

The company celebrates World Water Day every year in partnership with prestigious National Institutes & State Agricultural Universities. In past, to conserve rain water, company has also funded the construction of check dams at Jugalpora, Devipura (District Sikar), Mainpuraki Dhani and Sankotra, (Jaipur district), Rajasthan, which are now fully operational and have been filled with rainwater. The company is also implementing various water harvesting units in various parts of Rajasthan, so that farmers have access to water for irrigation. In addition, Dhanuka had made a 'community water center' in Banethi Village in Rajasthan for providing fluoride free safe drinking water to people. The company strongly supports the government's



agenda in water conservation for irrigation and promotes 'Pradhan Mantri Krishi Sinchai Yojana' for enhanced water efficiency through 'Per Drop More Crop'.

The highlights of the Water Week include mass activations for its stakeholders which include farmers, trade channel partners, Agri community & employees reaching them through relevant mediums like farmer meetings, dealer meetings, agricultural fairs, haat & mandi activities.

Dhanuka Agritech celebrates 'World Water Week from 16<sup>th</sup> - 22 March each year under which more than 1100 field staff organizes farmers' meetings across country, educating them on water conservation in field, organizes multiple activities in schools across India. The activities are designed to raise awareness on importance of water conservation among children. With similar approach,





this year the company organized drawing and painting competition in 200 schools across many states which involved around 1000 students. Till now more than 1000 number of schools has participated in this initiative of Dhanuka Agritech Ltd.

Dhanuka Agritech Limited, since its foundation, had been a forerunner in serving the farming community and this is another step in the similar direction supporting Hon'ble Prime Minister's mission of 'Doubling the Farmers' Income by 2022'. This initiative by Dhanuka is to incentivize and encourage the adoption of new technologies by farmers. Recently, Dhanuka has also launched an award for farmers and institutes who are involved in saving water and rain water harvesting at a PAN India level. To sensitize country's youth about this alarming issue, Dhanuka Agritech promotes various campaigns to create awareness of water conversation every year. Since 2010, it has been celebrating World



Water Day on March 22 year on year in collaboration with National Institutes, and State Agricultural Universities; where lectures on water conservation are organized by industry leaders.

Dhanuka Agritech believes that if we try to conserve rain water, the agricultural scenario and the farmer's condition will immensely improve, which will invariably affect the overall country's economy. Including that, the company will remain dedicated in promoting this cause and will come up with various other mass awareness initiatives to save water.

Dhanuka strongly believes that all these measures along with government initiatives will bring a major change towards imbibing the habit of water conservation across all communities in the country. ■■■





# Ministry of Agriculture and Cooperatives confirms National Farmers Forum at SIMA ASEAN Thailand 2018

**1** 4 March 2018, Bangkok, Thailand – The Ministry of Agriculture and Cooperatives (“MOAC”) is organizing the National Farmers Forum at SIMA ASEAN Thailand 2018 (“SIMA ASEAN”), from 6 to 8 June 2018, at IMPACT Exhibition and Convention Center, Bangkok, Thailand. The three-day National Farmers Forum is a comprehensive knowledge-sharing platform for Thailand’s agriculture industry and is expected to be attended by more than 3,000 farmers, head of cooperatives, dealers and distributors.

“With the strong support of MOAC’s National Farmers Forum and other activities onsite, SIMA ASEAN is cemented as the all-in-one agri-business trade platform in Southeast Asia,” said Mr. Loy Joon How, General Manager, IMPACT Exhibition Management Co., Ltd.

National Farmers Forum  
Expected to attract at least 1,000 farmers, head of cooperatives, dealers and distributors a day, the National Farmers Forum features key speakers including Dr. Wiwat Salyakamthorn, Deputy Minister, MOAC.



Highlights of the forum include “Khok Nhong Nha” - King Rama IX Farm Management Project which applies lessons learnt from King Rama IX, to land and water usage for farms and the innovations in Thailand’s







agriculture scene.

MOAC exhibition showcase

SIMA ASEAN presents an exhibition showcase featuring all 11 departments under MOAC, giving visitors a comprehensive overview of the entire agriculture landscape in Thailand. These departments include:

- Department Of Agriculture

- Department of Agriculture Extension
- Rice Department
- Royal Irrigation Department
- Department of Livestock Development
- Land Development Department
- Agricultural Land Reform Office
- Department of Fisheries
- Department of Cooperatives Promotion
- The Queen Sirikit Department of Sericulture
- The Agricultural Research Development Agency (Public Organization)

Farm exhibition showcase

This feature led by MOAC, showcases the ideal farm model with farming machines and technologies focusing on the main economic crops of Thailand - rice sugarcane and corn. Visitors at this showcase will learn the best agricultural practices, as well as the application of techniques, technology and machinery.

SIMA ASEAN Thailand takes place on 6 - 8 June at IMPACT Exhibition and Convention Center, Bangkok, Thailand. ■■■







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# Lemken launches online information portal



**A**gricultural practices and advancements differ globally since plants have their own differences and the location plays a role on their development as well. But through the exchange of knowledge from different agriculturally-involved individuals from all over the world, improvement of techniques can be experienced as well. It has made an impact on how information is shared, and being able to use this information for the advancement of the agricultural sector gives a great positive impact that is beneficial for everyone. IT has become a bridge for people from all over the world.

Lemken says its new global online information portal will allow it to further increase service levels. Called LEONIS (Lemken Online Information Service), and designed to provide customers with a wide range of options and search functions, the homepage includes operating instructions, spare parts lists, photographs, videos and brochures, all available to download.

**Comprehensive service has always been the strength of the German agricultural machinery specialist LEMKEN. LEMKEN has now launched the online information portal LEONIS on a global scale to extend this service even further. The LEONIS homepage provides customers with operating**



**instructions, spare parts lists, photos, videos and brochures, all available to download. Customers will have a choice of a wide range of options and search functions.**

The information area for dealers is a new feature. A single registration via the dealer portal now gives Lemken distribution partners additional online access to assembly and service instructions, implement cards, technology newsletters and training documentation. Providing them with access to the latest information, the company says dealers can conduct their own research



and download relevant after-sales information.

This allows distribution partners to conduct their own research and download relevant after-sales information, so they always have access to the latest information when needed. Service questions can be resolved via the search function, for example by entering an error code. The search then returns more comprehensive troubleshooting information to support specialist dealers in identifying and resolving problems. More supporting systems will be added soon.

Service questions can be resolved via the search function, for example by entering an error code. The search then returns more comprehensive troubleshooting information to support specialist dealers in identifying and resolving problems. More supporting systems will be added in the future.

LEONIS is available in German, English, French and Russian. ■■■



## Traction in Tractors, Petrol

## Push to Drive M&M's Growth

**Mahindra**  
Rise.

**Street expects increased margins from group's automotive division on rural recovery, along with higher PV sales from new models and less expensive BS-VI shift**

**T**he stock of India's largest tractor company Mahindra & Mahindra has outperformed the benchmark Sensex in the past one month, amid general turbulence, emerging as a defensive play driven by the recovery in tractor sales in the rural market, and attractive valuation among other automakers.

Investors' confidence in the company's earnings is likely to get reinforced further as it plans to increase its offerings of petrol vehicles in the next 2-3 years and a cost-effective solution for diesel variants to meet new emission norms. This would support earnings of the group's automotive segment, where growth has been wobbly.

Recovery of the rural market due to better monsoon and

significant volume growth in the tractor segment, where it is the market leader, is likely to improve investor





sentiment towards Mahindra & Mahindra (M&M). Upward revision in the tractor industry forecast by the company is also likely to support the stock that has been losing steam in the last one month due to rich valuations.

However, the degree of optimism may be limited by lower margins in the auto segment, which is affected owing to increasing competitive intensity in the utility vehicle space. Tractor business for M&M contributes nearly one-third of its revenues and two-third of the operating profit.

The company's vehicle portfolio is primarily based on the diesel power engine. The general preference for diesel vehicles has eroded due to several regulatory hurdles to control pollution, and also due to narrowing of differences between diesel and petrol prices.

Two consecutive years of normal-to-good monsoons, improved crop production, easy availability of credit to farmers and increasing use of tractors in non-agricultural sectors are responsible for the growth of tractor sales in India, it said, adding the sector also benefits from low penetration of tractors. Higher

delinquencies for tractor loans also show the continued stress in the agricultural sector. As around 45 per cent of the total tractor sales are financed through organised channels, loan delinquency rightly represents the average credit profile of a farmer; which might worsen in case of inadequate monsoons in FY19, thus impacting the additional demand for tractors

Further, automakers need to rethink their plans of diesel and petrol vehicle offerings after implementation of the BS-VI norms as the price difference will widen. According to an early indication by the automakers, the prices of petrol vehicles will increase by INR 20,000-40,000, and diesel by INR 1,00,000-1,50,000 per vehicle after BS-VI norms roll out. The company has developed a BS-VI engine at nearly 50% lower costs than the current export model. These steps will help support volume growth in passenger vehicle segment which has been in low single digits between FY16 and FY18.

M&M in the recent analyst meet has said it has made significant progress in developing a petrol engine in the range of 0.6 litres to 2 litres, which can deliver higher torque at lower RPM. This will help in rolling out petrol





SUVs that can deliver performance on par with diesel models. M&M is planning to launch a petrol vehicle in the next two years.

The company plans to create fungible capacity between petrol and diesel vehicles, which should help tackle variable demand mix in future. Also, the company will be launching new MPV, a compact SUV on Tivoli platform and a new Rexton.

The Street is pricing in a passenger vehicle growth of 11% and 12% for the FY19 and FY20 respectively. The passenger vehicle revenue, reflected in the automotive segment accounts for two-thirds of volumes and one third of operating profit.

Any improvement in capacity utilisation of PV segment will lead to improved margins of the automotive segment. The operating margin of the segment stood at 8.5% in Q3FY18, while the tractors business margin stood at 20.5%. ■■■





# Sonalika Tractors sells 1 lac tractors in FY'18

**SONALIKA**  
HEAVY DUTY. JAISE AAP.

**I**nternational Tractors Limited develops, manufactures, and markets tractors for the farming community. It offers garden, utility, and agriculture tractors; and implements, including disc harrows, cultivators, disc ploughs, and MB ploughs. The company also offers trouble shooting and support services. It serves customers through distributors and dealers worldwide. The company was incorporated in 1995 and is based in Hoshiarpur, India.

International Tractors Limited operates as a subsidiary of Sonalika Group. Incorporated in 1969 to accomplish newer heights of success, Sonalika Group has come a long way. Today the group is among the top three tractor manufacturing companies. Country's one of the largest tractor manufacturers Sonalika International Tractors Limited (ITL) for the first time achieved the annual sales of 1 lakh tractors in FY18, registering an overall growth of 22%.

The company has recorded a robust growth of 56% in the Q4 FY'18, surpassing the industry growth. In March, the company has registered phenomenal growth of 80%, with the total sales of 12,791 tractors.

Commenting on this dream come true milestone, Raman Mittal, Executive Director Sonalika ITL stated, "In FY'13, when we sold 50,853 tractors, we set a vision for ourselves to achieve the 1 lac milestone by FY'18. To achieve this dream we kept farmers at the centre point.



We started making customized products best suited for every state, every type of soil conditions and multiple applications like puddling, orchard farming, potato farming, rotavator, cultivator and many more. It was a simple objective but required very complex solution, it meant having more than 1000+ variants with most advanced technology at a competitive price which has resulted in widest product range from 20-120HP. **The company has recorded a robust growth of 56% in the Q4 FY'18, surpassing the industry growth. In March, the company has registered phenomenal growth of 80%, with the total sales of 12,791 tractors.**

Our products are manufactured with strong research and manufacturing engineering. To achieve this, we have invested extensively in building in-house capabilities for newer technologies like CRDi and implements, which required building a huge manufacturing facility where the large variety of products can be made at best quality and price with flexibility to match seasonal demands. All this resulted in creation of world's largest manufacturing facility. Our focus on innovative technology helps in enhancing the farm productivity, which has led Sonalika to be chosen by Government of India as the contributing partner with Niti Aayog for doubling farmer's income by year 2022."







Speaking of the company's future plans and industry outlook, Mittal commented, "Our focus across all geographies has led us to be one of the leaders across states as well as presence over 100 countries with leadership in 4 countries. We will continue to strengthen our presence in Europe & USA markets with advanced tractors meeting the stringent emission norms. All this have been achieved on the backdrop of simple belief of providing best solutions to the farmer and be a partner in his economic growth.

We have launched new range of Sikander tractors and will be soon launching technologically advanced new

series of next generation tractors meeting all future norms. We shall continue to invest in strengthening our technology platform to offer customized farming solutions.

We are looking forward for a favourable weather in 2018. Favourable monsoons, combined with the government's pro-agriculture allocation should enable the industry to grow at a steady pace. With the growth trend seen in Q4, we are confident to continue this growth momentum, surpassing industry growth. We are taking forward the Make in India story and enabling farmers to enhance their prosperity, while being a part of their lives." ■■■

# New compact multi-tasking John Deere tractor comes to market

**JOHN DEERE**

If you excel in the areas that matter most, you'll exceed expectations as well. That's why this John Deere 37 horsepower 3038E Compact Utility Tractor package has a long list of possibilities. For just \$319 per month and no money down, this versatile package includes the 3038E compact tractor, a D160 utility loader, and an RC2060 cutter. Plus, you can add an 18-foot trailer for just \$29 per month. John Deere's new 3038E compact tractor is an economical and versatile machine suitable for a wide variety of work including landscaping, ground care, sports turf, rural property and equestrian tasks.

John Deere's new 3038E compact utility tractor is aimed at rural property owners, equine and small-scale livestock operations, landscape contractors and ground care maintenance service providers who are looking for a machine designed to handle a variety of tasks. The 3038E is equipped with a powerful, emissions-compliant Stage IV diesel engine developing 37.3hp. A hydrostatic transmission with Twin Touch foot pedals provides the operator with simple, comfortable controls to select the right speed for the job at hand.







Combined with power assisted steering, the Twin Touch pedals are intuitive and easy to use and enable the operator to maximise productivity. The tractor's independent PTO can be engaged on the go, eliminating the need to stop and use the clutch. The 3038E also features an easy-lift bonnet that provides wide-open access to the engine bay for maintenance.

A new 300E front loader has been designed to complement the 3038E and features a curved boom and durable components. Together with the tractor's tight turning circle, this offers increased manoeuvrable combination for materials handling. Four-wheel drive is available as standard for more demanding applications and difficult ground conditions.

The 3038E compact tractor also offers telescoping draft links as a factory or field installed option. This makes attaching and removing rear implements easier and increases overall performance in the field.

"This new tractor is easy to operate, easy to maintain, easy to own and easy to buy," says Carlos Aragonés, John Deere's European Turf Segment Manager. "No matter what the task, the 3038E compact tractor delivers John Deere quality and reliability at a budget-friendly price."

"The 3E Series is designed to make our customers' work easier," says Scott Schadler, John Deere Product Marketing Manager. "Their compact size, dependability, implements capabilities and affordability make the 3E Series a versatile tool for



loading, hauling, blading/grading, digging, tilling and mowing.”

The 3032E and 3038E are equipped with powerful, emissions-compliant Tier 4 Final engines with 31.1 (22.3 kW) and 37.3 (27.4 kW) hp, respectively. A

hydrostatic transmission with Twin Touch pedals provides operators with simple, comfortable-to-use controls to find the right speed for the job at hand. It’s as easy as pressing a single foot pedal to go forward and another foot pedal to go in reverse. Automotive-style cruise control is optional. Intuitive controls are color-coded (orange for throttle and shifting; black for hydraulics; yellow for power take-off [PTO]) for easy operation.

Both models feature a flat, uncluttered, open station operator platform. A new, higher back seat provides added comfort for long days of work. A foldable, certified rollover protection structure (ROPS) is designed to provide easier storage. Without tools, the operator can manually fold the safety device down for easy parking in a garage or shed. The exhaust system was moved from the top of the tractors and now runs parallel to the ground for improved visibility and a cleaner look.





Four-wheel drive comes standard on the 3032E and 3038E for tough applications and difficult ground conditions. To get the most versatility, the machines can be equipped with the John Deere iMatch Quick-Hitch. iMatch allows faster hooking and unhooking of hitch-mounted implements, such as box scrapers and rotary tillers. The 3E Series is compatible with a broad range of implements, including mowers, rear blades and posthole diggers. A factory-installed loader option is also available.

The 3032E and 3038E are part of the emerging E Series Tractor line-up. With more than 20 configurations, the E Series compact/utility tractors offer a family of capable, value-spec

machines, ranging from 22 to 100 hp.

“These tractors are easy to operate, easy to maintain, easy to own and easy to buy,” says Schadler. “No matter what the chore, there’s an E Series tractor that delivers John Deere quality and reliability at a budget-friendly price. In fact, the 1023E sub-compact tractor has a suggested U.S. list price starting at under \$12,000.”

Like the rest of the compact utility tractor line-up, the 3E Series is an eligible purchase within the GreenFleet Loyalty Rewards program. The industry-exclusive loyalty program from John Deere is designed to help customers manage their equipment more easily and cost-effectively. ■■■



# EVENT CALENDAR

## MAY 2018



**Int'l Agricultural Fair**  
15-21 May, 2018  
Novi Sad, Serbia



**Bata Agro**  
15-18 May 2018  
Stara Zagora, Bulgaria



**Caspian Agro**  
16-18 May 2018  
Baku, Azerbaijan



**MaskinExpo**  
24-26 May 2018  
Märsta, Sweden

## JUNE 2018



**AGRO 2018**  
06-09 June, 2018  
Kiev, Ukraine



**Agritec Africa 2018**  
20-22 June 2018  
Nairobi, Kenya



**Fieldays**  
13-16 June 2018  
Hamilton, New Zealand

## April 20188



**Agri Intex**  
13-16 April 20188  
Coimbatore, India

## April 20188



**NAGRITECH**  
25-27 April 20188  
Jakarta, Indonesia



**IFT International**  
26-28 September 2018  
Jakarta, Indonesia



**Moldagrotech Chişinău**  
17-20 October 2018  
Chişinău, Moldova



**AGRI FEST**  
24-26 October 2018  
Lucknow, India







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