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Dynamic Dairy Farming with Artificial Intelligence System

Artificial Intelligence (AI) is the development of computer-aided systems that are able to perform tasks which normally require human intelligence. Such systems use different tools like visual perception, speech recognition, decision-making, and many more. Recent achievements in AI development for dairy farm management is going to make the life of farmers easier in coming future. Dairy farmers are often busy with routine works such as cleaning cowsheds, milking, and feeding. So it's very difficult to determine the condition of cows sometimes for them. If this continues, they will remain too busy to ensure the quantity and quality of milk and dairy products. A group of researchers from the Institute of Scientific and Industrial

Research, Osaka University, developed a technique for monitoring health of dairy cattle with high frequency and accuracy in the farmers' stead by using a camera and AI with the aim of realizing a smart cow-house. This group established a method for the early detection of lameness (hoof disease) from cow gait images with an accuracy of 99% or higher by using their own human gait analysis technique.

Such innovative applications of Artificial Intelligence will surely revolutionize the dairy industry while making the farmers' life easier.

Dr. F H Ansarey Managing Director & CEO ACI Agribusiness



The Smart Cowhouse Model with Artificial Intelligence, PC: Osaka University

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ACI Yucca Plus



On 4 June 2017, ACI Animal Health launched ACI Yucca Plus for fisheries. It contains Yucca schidigera which is enriched with Probiotics.

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Seed HealthTests: Present and Future possibilities



Seed Viability, vigour and other quality traists including germination have well-set genetic linkages with the performance of the crops as to high yield and ultimate quality production.

Seed PDS Review Meeting: Rabi 2016-17

The 1st PDS Trial Review and Planning Meeting of ACI Seed held on 18 June 2017 at ACI Center, Dhaka. All PDS Officers and representatives from the Product Management, Marketing Services and Sales Team of ACI Seed attended the meeting.





Higher Crop Yields by Boosting Photosynthesis?



Photosynthesis is one of the most complicated and important processes -- responsible for kick-starting Earth's food chain.

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Biotech Corner

Seed HealthTests: Present and Future possibilities

Seed Viability, vigour and other quality traists including germination have well-set genetic linkages with the performance of the crops as to high yield and ultimate quality production. Quality seed, also termed as healthy seed, is defined as physically free from innert materials, weed seeds and other crop seeds and physiologically a high germination percentage with high seedling vigour; and free from disease organisms under apropriate moisture content. It has been widely noted that that the use of quality seeds, other factors remaining high constant, can help in increasing the yield up to 15 to 20 percent. Further, adding on the utilization of guality seeds will also optimally increase the productivity potential of other farm inputs, such as irrigation, fertilizers, pesticides and others.

In Bangladesh the Seed Certification Authority (SCA) is the only statutory body authorized to undertake certification of Breeder, Foundation and Certified classes of seeds of crops. The agency targets to make available sufficient quantities of high quality seeds to the farmers that will increase productivity and attain sustainable food security. But the scenario is slightly different than the mission of the SCA. The work load of the SCA for certication of seeds from BADC and all other companies are quite high. Thus many of the companies have been testing their own seeds and marketing as Truthfully Labelled Seeds (TLS). Out of the total seeds used in sowing and planting of crops every year only about 15-16% are from the formal sources of seed businesses while rest are from the farmer saved seeds. Thus. their quality is not under testing/certification provisions. These seed could also be brought under certification process provided the facilities are increased and well distributed within the country under one regulatory provisions of the SCA. This could have been like the ISTA which gives accrediatation to a number of centres including private companies all over the world for testing under their control and supervisory provisions of certification. It is where the tests for virus and other diseases are done while the present provisions are mostly for physical puity and seed gernimation. At the moment the Advance Seed Research and Biotech Centre of the ACI has been underatking virus testing in addition to its physical purity tests as per ISTA standards not only of its own seeds but also of the government seed sources. This means the private sector laboratories will be able to test seed and train manpower for such works as per SCA and ISTA rules. The supervision and monitoring by SCA will allow the laboratories to carry out a vast number of health tests on notified as well as non-notified crops as per demand from seed businesses to maintain the supply of quality seeds. Of course provisions of the services will be subjected to fees. Extensive assistance of Adeeba Raihan, Senior Scientist, ASRBC, CI Ltd., is highly acknowledged.

Prof. Lutfur Rahman,

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Advisor, Agribusinesses & Editor, Biolife



Innovation and New Products

ACI Yucca Plus

On 4 June 2017, ACI Animal Health launched ACI Yucca Plus for fisheries. It contains Yucca schidigera which is enriched with Probiotics. The Yucca schidigera extract contains saponin and glycoponent, while the Probiotics are Rhodopseudomonas sp. and Bacillus subtilis. Saponin and glycomponent in ACI Yucca Plus help to reduce and control ammonia and other harmful gases that leads to suitable pond environment for aquaculture. The probiotics present in this product inhibit the growth of harmful bacteria, prevent formation of black soil and maintain better soil quality. ACI Yucca Plus reduces mortality rate of fish/shrimp and regulates pond pH. It improves Feed Conversion Ratio (FCR) of fish and shrimp. Additionally it helps to produce natural food in pond or gher. ACI Yucca Plus is available in 100 ml packs.



Pepmin Plus

Pepmin Plus is an oral solution with Amino acids and minerals for the maximum production and optimum growth of poultry. Each 100 ml of Pepmin Plus contains L-Lysine (As Hydrochloride) USP 1250.00 mg, L-Methionine USP 500.00 mg, L-Threonine USP 620.00 mg, L-Tryptophan USP 90.00 mg, Glycine USP 760.00 mg, L-Histidine USP 250.00 mg, Arginine USP 500.00 mg, L-Alanine USP 200.00 mg, L-Aspartic Acid USP 250.00 mg, L-Cystine USP 10.00 mg, L-Glutamic Acid USP 75.00 mg, L-Isoleucine USP 352.00 mg, L-Leucine USP 490.00 mg, L-Phenylalanine USP 533.00 mg, L-Proline USP 100.00 mg, L-Serine USP 100.00 mg, L-Tyrosine USP 25.00 mg, Hydroxyproline USP 100 mg, L-Valine USP 360.00 mg, Calcium USP 20 mg, Phosphorus USP 1 g, Magnesium USP 30 mg, Potassium USP 900 mg, Sodium USP 4.60 g, Chlorine USP 490 mg, Sulphate USP 8.80 mg, Copper USP 0.50 mg, Manganese (As Manganese Sulfate M/H) USP 0.50 mg, Iron (As Dried Ferrous Sulfate) USP 9.00 mg, Zinc (As Zinc Sulfate M/H) USP 10.00 mg. The combination of 19 essential Amino Acids and 11 minerals has made it an ideal oral solution. Amino Acids are essential part of muscle, skin, feather, bone matrix, ligament and other body parts.



So Pepmin Plus helps to increase body weight and feather. It also helps to increase the production and weight of eggs. With the help of different minerals, it increases the Feed Conversion Ratio (FCR) through enzymatic and biochemical actions. ACI Animal Health launched Pepmin Plus on 10 June 2017. It is available in 100 ml, 500 ml and 1 Liter bottles.

Events and Activities

Seed PDS Review Meeting: Rabi 2016-17

The 1st PDS Trial Review and Planning Meeting of ACI Seed held on 18 June 2017 at ACI Center, Dhaka. All PDS Officers and representatives from the Product Management, Marketing Services and Sales Team of ACI Seed attended the meeting. The meeting reflected on the main purpose of Product Development Service (PDS), which is to select varieties that are adapted to this environment and to meet market demand of the selected promising varieties.

Mr. Sardar Ali Mortuza, Business Manager, organized the seminar for PDS Team and Business Management Team. In his welcome speech, Mr. Mortuza highlighted the importance of the PDS activities, especially for addressing issues as selecting new promising crop varieties. Mr. Sudhir Chandra Nath, Head of Business, presented 'PDS Guideline', emphasizing the importance of Screening New Materials and Frontline Demonstration. Product Manager Mr. Md. Abdullah Al Masud conducted a session on "Product USP: Creating Market Demands". He spoke about the importance of a Unique Selling Point in marketing of a business or product.

PDS Manager Dr. Mohammad Muhebbullah Ibne



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Hoque, presented the findings of the last Rabi/Boro Season's PDS Trial activities. In the last season, PDS Team conducted trials of 350 varieties, accessions, and traits of 23 different vegetables and cereal crops. These varieties were received from 25 Foreign Principal Companies, ACI R&D, and ASRBC. The technical sessions were followed by group discussions among the participants. Lastly, PDS Manager handed over a compiled 'PDS Trial Report/ Rabi 2016 –17' to Head of Business and Business Manager.

ACI Fertilizer at National Tree Fair 2017





Events and Activities



ACI Fertilizer participated in the month long Tree Fair 2017 which started on 4 June 2017 at Agargaon, Dhaka. ACI Fertilizer has taken part for the 7th time consecutively in this annual national fair held in the capital. The tagline of this year's fair was "জাতীয় বৃক্ষমেলা ২০১৭". Considering the environmental change in recent years, the fair was organized for the promotion of tree plantation. Strengthening the consumption of organic food, promoting rooftop gardening, lawn gardening, gardening in educational institution premise and backyard of houses were also in the agenda. Total 105 stalls had displayed different types of plants and trees in their stall for promoting urban gardening scheme initiated by city corporations. As ACI Fertilizer believes in the motto of ecofriendly environment as well, it had showcased wide range of organic fertilizer, balanced fertilizer and micronutrients fertilizer for plants to the visitors, individual buyers as well as to the nurseries. Special discounts and promotional offers were available for the visitors of the Tree Fair.

ACI Motors: Sharing Ramadan's Spirit





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Events and Activities







During the holy month of Ramadan, all the portfolios of ACI Motors shared the spirit of Ramadan

in numerous locations while arranging and having Iftar with their stakeholders. As part of it, a series of Mechanics Meet and on spot Iftar gatherings took place from 10 to 20 June 2017 at many of its dealer points. The purpose of the meeting was to interact with the local mechanics, share technical knowledge and having iftar with all at the same table. In many of these iftar programs other stakeholders like commission agents, dealer managers, sales influencers, brand promoters, and others took part. Through this Iftar programs ACI Motors shared the spirit of Ramadan with around 5520 people throughout the country with 184 Iftar arrangements at 21 different areas.

Events and Activities

YAMAHA Motorcycles Promotional Showcase



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ACI Motors Ltd, the sole distributor of YAMAHA Motorcycle in Bangladesh, displayed its various models at Bashundhara City Shopping Mall, Dhaka during the Ramadan. While the visitors and customers got the opportunity to see and know about the features of different models from ACI Motors representatives, a special discount offer for the model Saluto was available throughout the showcase.

Agri-tech & Communication

Higher Crop Yields by Boosting Photosynthesis?

Photosynthesis is one of the most complicated and important processes -- responsible for kick-starting Earth's food chain. While we have modeled its more-than-100 major steps, scientists are still discovering the purpose of proteins that can be engineered to increase yield, as scientists recently proved in Science. Now researchers have uncovered secrets about another protein, CP12 -- the full understanding of which may provide an additional route to boost yields in the future. There are three forms of the protein CP12 that regulate the enzymes GAPDH and PRK. Think of the enzymes as the workhorses and CP12 as the groom holding the reins. CP12 tells them to get to work when there's light and reins them in when it's dark.

"CP12 is an important component because it helps plants respond to changing light levels, for example when the plant is shaded by a leaf or cloud," said first author Patricia Lopez, a postdoctoral researcher for Realizing Increased Photosynthetic Efficiency (RIPE) who led this research. "CP12 stops the activity of the enzymes within seconds but without CP12, it will take several minutes to slow the activity, costing the plant precious energy." Published in the Journal of Experimental Botany,



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Ten-week-old Arabidopsis plants highlight the striking effect of the absence of CP12 on plant growth. From left to right: wild-type plant with normal levels of CP12; plant with no CP12-1 or CP12-3, and reduced levels of CP12-2; and the two plants on the right have hardly any CP12. Photo Credit: Carl R. Woese Institute for Genomic Biology, University of Illinois at Urbana-Champaign

Lopez and co-authors found not all CP12 enzymes are created equal. Turns out that CP12-3 is not part of this process -- whereas CP12-1 and CP12-2 are in charge and can cover for each other. Get rid of all three, and the plant can't photosynthesize efficiently, resulting in a drastically smaller plant with fewer, smaller seeds

(Source: Agriculture and Food News, Science Daily. www.sciencedaily.com)

Plants' Unique Gene Expression Networks to Cold Additional Additio

A study led by complexity scientist Samuel Scarpino explored gene co-expression networks that have evolved to help plants withstand drought and cold. The paper, published in the Proceedings of the Royal Society B, focused on Arabidopsis and identified two unique gene expression networks: one adapted to cold, and the other to drought.

The two responses differ strategically and in evolutionary age. During drought, tissues in roots, stems, and leaves perform distinctive operations. When it begins to cool, cells in every tissue cope similarly, and by means that might as well have been applied, in prototype, by single-celled ancestors eons ago.

The researchers found that the genes that specifically cooperated during cold mapped to central, broadly networked positions within the roughly 10,000-gene network. By contrast, genes that cooperated specifically in drought mapped to



peripheral clusters within the overall network. The research team concludes that the architectures of the two gene networks echo how plants behave under the two stresses.

(Source: Crop Biotech Update, International Service for Acquisition of Agri-Biotech Applications. www.isaaa.org)



Sunflower Genome and More Resilient Crops

University of Georgia researchers are part of an international team that has published the first sunflower genome sequence. This new resource will assist future research programs using genetic tools to improve crop resilience and oil production. They published their findings today in the journal Nature. Known for its beauty and also as an important source of food, the sunflower is a global oil crop that shows promise for climate change adaptation because it can maintain stable yields across a wide variety of environmental conditions, including drought. However, assembling the sunflower genome has until recently been difficult, because it mostly consists of highly similar, related sequences.

The research team in North America and Europe sequenced the genome of the domesticated sunflower Helianthus annuus L. They also performed comparative and genome-wide analyses, which provide insights into the evolutionary history of Asterids, a subgroup of flowering plants that includes potatoes, tomatoes and coffee. They identified new candidate genes and reconstructed genetic networks that control flowering time and oil



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John M. Burke is a professor of plant biology at the University of Georgia. Photo Credit: Paul Efland/UGA

metabolism, two major sunflower breeding traits, and found that the flowering time networks have been shaped by the past duplication of the entire genome. Their findings suggest that ancient copies of genes can retain their functionality and still influence traits of interest after tens of millions of years. (Source: Agriculture and Food News, Science Daily. www.sciencedaily.com)

Tomatoes: Making a Super Producer

Tomatoes have come a long way from their origins as pea-sized berries due to humans breeding tomato plants to produce bigger fruit. However, favorable mutations that went along with increased fruit size and other beneficial traits do not always play well together. A study published in Cell on May 18 found that natural mutations in two important tomato genes that were selected for different purposes in breeding can cause extreme branching and reduce fruit yield when they occur in the same plant. However, the researchers have found a way to use those genes to create an improved tomato plant that grows a larger number of tomatoes.

One of the two genes is ancient, dating back to when Native Americans in South and Central America domesticated the tomato plant more than 8,000 years ago. That gene causes the green leafy "cap" on top of tomato fruits to grow larger, the researchers found. The other gene, called Jointless2, is a 20th-century mutant, which results in a smoother stem connected to the fruit and a firmer attachment to the plant. Jointless2 is particularly sought after because it makes tomatoes easier to



This photograph shows how by reorganizing the genetic combinations of tomato fruit yield increasing mutations, researchers achieved weakly branched flower-bearing shoots that gave higher yield. Photo Credit: Zachary Lippman



Agri-tech & Communication

harvest, but the presence of both mutations in one plant causes the branches that make the flowers (and later, fruit) -- known botanically as "inflorescences" -- to branch wildly into patterns that look "a bit like a broom."

"On the surface, you would think that's great because more branches on each inflorescence means more flowers, which would mean more fruits; but in fact, more branches and flowers doesn't always translate to more fruits," says senior author

Apple Genome Sequence Published

An international consortium of research institutions from France, Italy, Germany, the Netherlands, and South Africa, including researchers from Wageningen University & Research, has published a highquality genome sequence of apple.

The genome sequence provides new insights into the organization of the apple genome. Ninety-three percent (93%) of the 42,000 putative genes were validated through RNA sequencing. This information is useful for the identification of genes that control a trait of interest and for the development of DNA-based diagnostic tests that can accelerate breeding of new varieties.

The new insights in the apple genome include a clear view on the duplication patterns among the 17 chromosomes of apple. This information facilitates identification of gene copies with similar function. 'Repetitive regions' have been assembled, and these may be involved in regulating gene expression.

Zachary Lippman, a plant geneticist at Cold Spring Harbor Laboratory. "In order to make those fruits, the plant has to pump a lot of resources into the young fruits as they start to grow. But plant can't handle that imbalance of having too many fruits, so the fertility is quite low." In other words, highly branched tomato plants end up producing fewer tomatoes.

(Source: Agriculture and Food News, Science Daily. www.sciencedaily.com)



Finally, a new type of repeat sequence wasfound that may be specific for centromeres, which may lead to new insights in chromosome division and replication.

(Source: Crop Biotech Update, International Service for Acquisition of Agri-Biotech Applications. www.isaaa.org)

New Innovation Feeds the World with More Fish Protein

As the world faces a projected population increase from today's 7.5 billion people to 9 billion people by 2050, the demand for sustainable food sources is on the rise. The answer to this looming dilemma may well reside within the booming field of aquaculture. While wild fisheries have been on the decline for the last 20 years, aquaculture, or fish farming, is the fastest growing food-producing sector in the world, and will play an increasingly vital role in our planet's food resources in the years to come.

One of the challenges to aquaculture is that reproduction, as an energy intensive endeavor, makes fish grow more slowly. To solve this problem, Prof. Berta Levavi-Sivan at the Hebrew University of Jerusalem identified tiny molecules named Neurokinin B (NKB) and Neurokinin F (NKF) that are secreted by the brains of fish and play a crucial role in their reproduction. Prof. Levavi-Sivan, a specialist in aquaculture at the Hebrew University's Robert H. Smith Faculty of Agriculture, Food and Environment, then developed molecules that neutralize the effect of NKB and NKF. The molecules inhibited fish reproduction and consequently led to increased growth rates.

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"Better Fish Growth, More Aquaculture Jobs."These inhibitors can now be included in fish feed to ensure better growth rates. For example, young tilapia fed the inhibitors in their food supply for two months gained 25% more weight versus fish that did not receive the supplement. So far, NKB has been found in 20 different species of fish, indicating that this discovery could be effective in a wide variety of species. The technology developed by Prof. Levavi-Sivan and her team was licensed by Yissum, the Technology Transfer company of the Hebrew University, to start-up AquiNovo Ltd., established and operating within the framework of The Trendlines Group. AquiNovo is further developing the technology to generate growth enhancers for farmed fish.

(Source: Agriculture and Food News, Science Daily. www.sciencedaily.com)



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Kaye Innovation Award winner and Hebrew University aquaculture expert Prof. Berta Levavi-Sivan on the job in Uganda. Photo Credit: Hebrew University

Scientists Work to Develop Heat-Resistant 'Cow of the Future'

University of Florida scientists are working to breed the "cow of the future" by studying the more heattolerant Brangus cow -- a cross between an Angus and a Brahman. RalucaMateescu, an associate professor in the UF/IFAS department of animal sciences, is part of a team of UF/IFAS researchers that has received a three-year, \$733,000 federal grant for this research. "The grant allows us to track down DNA segments from the two breeds and figure out which regions of the cow's DNA are important to regulate body temperature," Mateescu said.

More than half the cattle in the world live in hot and humid environments, including about 40 percent of beef cows in the United States, Mateescu said. By using genomic tools, researchers aim to produce an animal with superior ability to adapt to hot living conditions and produce top-quality beef. Long-term, UF/IFAS researchers want to develop the knowledge and tools the cattle industry needs to increase tolerance to heat stress. At the same time, researchers hope to increase efficiency in production, reproduction and meat quality. "This offers a powerful new approach to address the challenges of climate change and develop climate-smart



University of Florida scientists are working to breed the "cow of the future" by studying the more heat-tolerant Brangus cow -- a cross between an Angus and a Brahman.

Photo Credit: Courtesy RalucaMateescu, UF/IFAS

productive cattle for a future, hotter world," Mateescu said.

(Source: Agriculture and Food News, Science Daily. www.sciencedaily.com)



Antioxidant-Rich Purple Rice Created

Researchers in China have developed a genetic engineering approach capable of delivering many genes at once and used it to make rice endosperm -- seed tissue that provides nutrients to the developing plant embryo -- produce high levels of antioxidant-boosting pigments called anthocyanins. The resulting purple endosperm rice holds potential for decreasing the risk of certain cancers, cardiovascular disease, diabetes, and other chronic disorders. The work appears June 27th in the journal Molecular Plant.

"We have developed a highly efficient, easy-to-use transgene stacking system called TransGene Stacking II that enables the assembly of a large number of genes in single vectors for plant transformation," says senior study author Yao-Guang Liu of the South China Agricultural University. "We envisage that this vector system will have many potential applications in this era of synthetic biology and metabolic engineering." To date, genetic engineering approaches have been used to develop rice enriched in beta-carotene and folate, but not anthocyanins. Although these health-promoting compounds are naturally abundant in some black and red rice varieties, they are absent in polished rice grains because the husk, bran, and germ have been removed, leaving only the endosperm.

(Source: Agriculture and Food News, Science Daily. www.sciencedaily.com)



This is a photograph of purple endosperm rice. Photo Credit: YQinlong Zhu of the South China Agricultural University

Readers' Corner

Believe it or not!

- Bananas are about 99.5% fat-free.
- There are more than 7,000 varieties of apples grown in the world.

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- A hive of bees flies over 55,000 miles to bring you one pound of honey.
- Lettuce is a member of the sunflower family.



• Eggs age more in one day at room temperature than in one week in the refrigerator.

Nutrition Chart

Food Type	Quantity		Calories (Kcals.)	
Jam/Jelly	1 Tbsp (20 gm)		55	
Butter	1 Tbsp	-	45	
Sugar	5 gm		20	
Brown Sugar	5 gm	-	16	
Honey	5 ml		16	

Source: www.nriol.com

Agro Tips

If you are actively engaged in any form of farming, you should know some symptoms of boron deficiency (in absence or low supply): dying growing tips and bushy stunted growth, extreme cases may prevent fruit set. Some crop-specific symptoms include:

- Cabbage- distorted leaves, hollow areas in stems.
- Cauliflower- poor development of curds, and brown patches. Stems, leafstalks and midribs roughened.
- Pears- new shoots die back in spring, fruits develop hard brown flecks in the skin.
- Strawberries- Stunted growth, foliage small, yellow and puckered at tips. Fruits are small and pale.
 Boron is an essential micronutrient for plant growth and development, but is required in very small quantities.



Readers' Corner

Sharing is caring!

Did you know that plastic water bottles can take between 400 and 1,000 years to decompose? Moreover, only 1 in 5 plastic bottles is recycled. In the United States alone, 47 billion plastic bottles are discarded annually, and worldwide, enough plastic is thrown out in a single year to circle the globe four times. However, Plastic bottles can become beautiful, reusable items if we can modify it smartly. Here you can see such an example in the following picture.

You can try something similar on your own.







ACIAgribusinesses Creating Wealth for Farmers

ACI Agribusinesses, the leading agriculture integrator in Bangladesh, is dedicated to gaining prosperity of Bangladesh through food security. ACI Agribusinesses offers complete solutions to farmers and also educates them about the technical know-how.