

## New ACI Seed Coating Technology for Enhanced Seedlings

I am happy to share that a polymer coating seed technology has been introduced for the first time in the seed industry of Bangladesh by ACI Seed. This new technology allows better utilization of applied insecticides and fungicides to seed for protection. Coating plant seeds prior to planting is a common practice in modern agriculture. The objective of such coating is to deliver the seed in a form that is larger, rounder, smoother, heavier and more uniform than the original seed. As crop protection mechanism, seed coatings can also be a carrier of fungicides, bactericides, and insecticides that protect the seed and the emerging seedling. Seed Coating Polymers are useful in binding required insecticide, fungicide to the seed surface and allow the release of the same when the seeds are sown to improve the pest resistance in early stages of crop development. Thus, the pesticidal, fungicidal performance is greatly enhanced using the Seed Coating Polymer.

Seed coating technology delays the exposure of seed to the soil until the soil reaches a specific temperature. At the critical temperature for soil, the coating allows the seed to be exposed and germination can occur. After Polymer coating, the germination of each and every seed is ensured. It can help us to avoid piracy as well. Due to the improved appearance through seed coating technology, seeds are usually more attractive.

We have always relied on new technologies for advancing our agriculture. We believe that our farmers will be benefited from the introduction of the new seed coating technology. Thus, we hope to ensure our mutually inclusive growth and advancement in the coming days.

**Dr. F H Ansarey**  
Executive Director  
ACI Agribusiness



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## Incorporation of C4 system for developing rice of the future

Rice is the most important staple food in Bangladesh covering more than 80% of the food grains consumed in the country. Currently, 11.47 m hectares of land are occupied with rice cultivation having an annual production of about 34.36 million tons with an average yield of about 3.0 t ha<sup>-1</sup>. Rice production, which was about 9.8 million tons during 1971-72, has been increased to 34.4 million tons in 2013-14 indicating that rice yield has been increased more than 3.5 times over that period. However, for the last few years the production has increased little because of both stagnation in the yield potential of rice and declination in the acreage of rice due to natural calamities such as salinity and drought.

Plants are grouped as C3, C4 and CAM based on the way how they assimilate CO<sub>2</sub>. Rice is in the C3 group and assimilates CO<sub>2</sub> into a 3-carbon compound by the photosynthetic enzyme ribulose-1, 5-bisphosphate carboxylase oxygenase (Rubisco). The enzyme Rubisco also catalyzes oxidation of ribulose-1, 5-bisphosphate (RuBP) in a wasteful process known as photorespiration. To minimize the loss of assimilated CO<sub>2</sub> incurred by photorespiration, C4 photosynthesis has evolved naturally, which have taken millions of years. The system has evolved more than 66 times independently in at least 19 families during angiosperm evolution from C3 ancestors. C4 photosynthesis entails alternations of cellular structures and developmental biochemistry of leaves and thus, they have developed CO<sub>2</sub> concentrating mechanism within their leaves which reduces the level of photorespiration. Rubisco from C4 species is efficient

than from C3 species in terms of carboxylation. As C4 plants like maize are more productive at higher temperatures typically experienced by rice, initiatives are being taken for inserting or developing C4 mechanism such as that found in maize into rice.

If C4 photosynthesis mechanism can be introduced in C3 rice, the crop would be able to increase photosynthetic efficiency while using scarce resources such as land, water, and fertilizer specifically nitrogen more. Moreover, as the crop will perform well under high temperature with less water and nitrogen; as well as confer indirect benefits on different types of rice ecosystems including the marginal lands.

The first planning meeting was held at the ASRBC where eminent rice scientists including Prof. Shahidur Rashid Bhuiyan, Pro Vice Chancellor, Sher-E-Bangla Agricultural University; Prof. Zeba I Seraj, University of Dhaka; Dr. KMS Aziz, Secretary, Bangladesh Academy of Sciences, Prof. Abdul Kader, Bangladesh Agricultural University, Prof. M A Khaleque Mian, Bangabandhu Sheikh Mujibur Rahman Agricultural University along with Dr M A Salam, Chief Rice Breeding Consultant and Dr. Md Zahidur Rahman, Principal Scientific Officer, ASRBC were present. Under the chairmanship of Prof. Dr. Lutfur Rahman, the members decided to undertake the challenges of such studies and develop a collaborative research coordinated by ASRBC.

### Prof. Lutfur Rahman

Advisor, ACI Agribusiness & Head of Advanced Seed Research & Biotech Centre



## Innovation and New Products

### Uni-Oxytocin Injection – promote delivery hormones

Uni-Oxytocin injection was launched by ACI Animal Health on 25 May 2015. Each ml Uni-Oxytocin injection contains Oxytocin 10 I.U. Oxytocin is a hormone secreted from posterior pituitary gland. It is usually secreted at the later stage of pregnancy, during and a few days after parturition. Moreover, Oxytocin promotes expulsion of

foetus and increases the secretion of milk by stimulating uterine musculature and myoepithelial cells around the alveoli of the udder. After parturition it helps in the expulsion of placenta and involution of uterus. Uni-Oxytocin injection is manufactured by UNIBIOTECH CO., LTD (Korea) and available as 10 ml vial.



### Farmatan®D – complementary feed for Dairy Cows

On 2 May 2015, ACI Animal Health launched Farmatan®D, a complementary feed for dairy cows. A daily dose of Farmatan®D reduces the inclusion rate of protein concentrate for 1 kg. Each Kg Farmatan®D powder contains Sweet chestnut extract, Sodium salt of organic acid, essential oil, zinc & Crude fiber q.s. to 1000 g. It increases

milk production and improves milk quality. It increases fat % of milk and reduces the incidence of diarrhea & mastitis. Farmatan®D protects intestinal mucosa, improves growth and feed conversion ratio. Pack sizes are 100 g and 20 Kg. It is manufactured by Tanin Sevnica (Slovenia).



### Aci-Levo® (Vet) – The ultimate protection from poultry infection

Aci-Levo® (Vet) is the ultimate protection for poultry from respiratory and urinary tract infection. Each 100 gm contains Levofloxacin hemihydrate USP 10.25 g equivalent to 10 g. Levofloxacin is a third-generation fluoroquinolone antibiotic which is effective against a number of Gram—positive & Gram-negative bacteria & specifically highly effective against the organisms that cause atypical pneumonia. Aci-Levo® (Vet) is twice as active as its isomers of first & second generation quinolones. It is one of the so-called respiratory quinolon. It is

effective against number of Gram-Negative, Gram-positive, anaerobic bacteria and Mycoplasma. Levofloxacin is rapidly and almost completely absorbed following oral administration within an hour of dose. Aci-Levo® (Vet) reduces the bacterial growth by inhibit the growth of topoisomerase IV enzyme of Gram-positive bacteria and DNA gyrase enzyme of Gram-negative bacteria. It was launched on 2 May 2015 by ACI Animal Health. Aci-Levo® (Vet) is available in 100 g sachet.



### Farmatan BCO – protector against poultry intestinal pathogen

On 18 May 2015, ACI Animal Health launched Farmatan BCO which is a complementary feed, blend of a natural plant extracts with calcium butyrate for poultry. Each 100 g contains- Sweet chestnut extracts & oak extracts 15 g, Calcium salt of butyric acid 20 g Plant oil and fat 50 g, Crude fiber q s to 100 g. Its micro-encapsulated form allows a slow release of active ingredient along intestinal tract to redact intestinal disorders. It stimulates the growth of villi in the intestinal tract resulting in

a better digestion and nutrient absorption. Farmatan BCO improves production parameters (example: daily weight gain, feed conversion ratio and laying rate). It improves egg quality and ensures less broken eggs. While increasing dry matter content of poultry, Farmatan BCO improves the environment of poultry shed and reduces ammonia gas. It is manufactured by Tanin Sevnica (Slovenia) and available in 100 g, 1 kg, 25 kg bags.



## Events and Activities

### ACI Agribusiness got award at International Agri-Tech Fair

ACI Agribusiness won the 2nd prize for the best stall-pavilion at 5th International Agriculture Technology Fair-2015 held on 28-30 May 2014 at Bashundhara Convention Centre, Dhaka. The fair aimed at showcasing modern technologies and providing attendees valuable information about those. Rural Development Board (RDB) of Bogra and LIMRA Trade Fairs & Exhibitions Pvt Ltd. has organized the three-day fair to introduce all the new agriculture technologies. ACI Agribusiness along with many researchers, producers, importers, technology users and marketing entrepreneurs of domestic and

international farms participated in the fair. Besides Bangladesh, over 100 organizations of 14 countries including India, US, Netherland, China, Germany, Korea, Turkey, Spain, Japan, Taiwan, Italy and Canada joined the fair.

The chief guest of the closing ceremony Honorable State Minister of LGRD, Mr. Moshuiur Rahman Ranga, handed over the award to Mr. M. Saifullah, Head of Strategy, ACI Agribusiness. Dr. F H Ansarey, Executive Director, ACI Agribusiness was the special guest for the closing ceremony.



### Seminar on 'Hygienic Mango Preservation and Marketing'

A seminar on 'Hygienic Mango Preservation and Marketing' held at the Institution of Engineering, Bangladesh (IEB), Dhaka on 30 May 2015. Chapai Nawabganj Zila Samity, Dhaka, organized the programme with Honorable Agriculture Minister Begum Matia Chowdhury as the chief guest. Former Director General of the Department of Agricultural Extension (DAE) M Enamul Haq

gave the keynote speech at the function. A Z M Mamtazul Karim, Director General of the Department of Agricultural Extension (DAE), Dr M H Ansary, Executive Director of ACI Agribusiness, Dr M Shafiqul Islam, Director of Chapai Nawabganj Horticulture centre took part in the seminar as discussants.



## Events and Activities

### Field Success: Rising Demand for Surokkha-Okra at Poba, Rajshahi

ACI Seed's 'Surokkha', a comparatively new variety of okra, has experienced a sharp rise in local demand at Poba, Rajshahi. The recent success came as a result of continuous efforts of the field force through regular demonstrations and field days. These activities, done during the last two years, helped most of the farmers of the upazilla to visualize the excellent performances of 'Surokkha' in terms of yield, fruit quality, and virus tolerance. The unique specialties this variety like attractive

glossy green fruits, long edible pods, high harvest frequency, very easy to pick – grabbed their attention.

According to Upazilla Agriculture Officer of the Department of Agricultural Extension (DAE) at Poba, nearly 150 acres of land has been brought under okra cultivation with a production target of 600 tons of okra. Poba okra seed market comprises nearly 1.0 MT. Now, ACI Seed is planning to meet this high demand by supplying seed in next coming season to be started from December 2015.



### Maize Cob Display: an Innovative Approach for Seed Promotion

"Seeing is Believing" - a ground-breaking product demonstration service which is recently introduced at different retailers' shops by ACI Seed in May 2015. Display of products at retailer's shop offers a unique opportunity to promote a new item and announce a sales call even after harvesting of crops. Through the service customers and consumers can choose a product prudently. Retailers are the best exhibitor as they are very close to the farmers. A display of Hybrid Maize: ULTRA & JANA HIT

of ACI-Godrej Agrovet Ltd is being held at retailer's shops at Bogra from 19 May 2015. The farmers of Bogra are satisfied with the yield and quality performance of variety: ULTRA & JANA HIT. Attractive orange kernels have grabbed the attention of farmers. The crop can withstand wind and storm. Cobs are also being displayed at farmer's house at Maria, Shahjahanpur of Bogra. The farmers are highly motivated to cultivate these varieties from the next season.



Display of ACI-Godrej Hybrid Maize (ULTRA & JANA HIT) at M/S Sheba Traders, Shibgonj, Bogra

## Events and Activities

### Balanced Fertilization promoted at Rangpur Agri-Tech Fair

ACI Fertilizer promoted balanced fertilization in Rangpur as it participated in a 3 day long Regional Agri-Tech Fair 2015 at DD Office Chatter, Lalbag, Rangpur. The exhibition was organized by Rangpur Agriculture Office and held on 5-7 May 2015. Rangpur City Mayor - Alhaz Sarfuddin Ahmed Jantu inaugurated the fair. The direc

tors and officers of DAE, BADC, Cotton Board, BINA, BARI, and BRRI were present in the program. Through out the fair ACI Fertilizer emphasized on balanced fertilization and its impact on crops, human being, and animal body. Demonstration of new technology products for visitors also took place.



### Organic Fertilization demonstrates Higher Yield at Noakhali

Recent Field demonstrations of ACI Fertilizer at Begumgonj, Noakhali showed higher yield after using ACI Organic Fertilizer and Micronutrients. The field days were arranged on Boro rice, maize, and vegetables under the supervision of Upazilla Agriculture Office.

One of the maize field days was held on 17 May 2015 at Hossainpur, Rajgonj, Begumgonj. Mr. Majibur Rahman, Additional Director, DAE, Chittagong Zone; Mr. Pranab Bhattacharjee, Deputy Director, DAE, Noakhali; Mr. Rezaul Karim Bhuiyan, Upazilla Agriculture Officer,

Begumgonj; Mr. Safik Ullah & Ziur Rahman, SAAO and around 120 farmers were present in the program. Mr. Mahbub Alam, Zonal Sales Manager, Comilla; Mr. Abu Mohammad Sayem, Area Manager, Comilla and Mr. Hafizur Rahman, Territory Manager, were also present in the field day on behalf of ACI Fertilizer. 10 decimals demonstration plot result was much higher (394 kg for using ACI Organic Fertilizer and 559 kg for using ACI Organic & Micronutrients) comparing to 10 decimals control plot (210 kg).





## Events and Activities

### Celebrating Success: Pleasure trip to Malaysia

ACI Fertilizer arranged a pleasure trip to Malaysia for their stakeholders who got a remarkable success in ACI Fertilizer business for the year 2014. The trip was held on 17-22 May 2015. The team of 24 persons was led by Mr. Bashir Ahmed, Business Manager, ACI Fertilizer and Mr. Arifur Rahman, Assistant Manager, Institutional Sales. The trip made them very delighted and motivated for more success in near future.



### Aqua Fertilizer –‘Fishcal’ motivational program at Nilphamari

As ACI Fertilizer is marketing its first aqua fertilizer 'Fishcal', motivational program for farmers on the product took place at Nilphamari on 24 May 2015. M/S Shuvo Traders, a local business entity, organized the program in Sadar Upazilla where General Manager, Sales and Regional Manager, Rangpur from ACI Fertilizer were present. 40 fish farmers were trained up through the program. During the visits, pH of pond water of the farmers was also tested for better result. It is remarkable that Fishcal increases the phytoplankton, improves the water quality, and helps to increase the oxygen level. It prevents the production of toxic gases like Hydrogen Sulphyte, Nitrite etc. while controlling the pH variation. Local farmers are happy to get such type of aqua fertilizer.



### Awareness Building for Better Yield at Faridpur

ACI Fertilizer arranged a group campaign program to build awareness for better yield at Faridpur on 16-19 May 2015. Mr. Abdul Sabur Khan, Area Manager-Kushtia; 7 Territory Officers and 10 Market Promoters were present during the program. The aim was to create awareness among the farmers for using ACI Fertilizer for better yield. 7 groups of ACI Fertilizer team went to the field to conduct spot farmers meeting, prescribe the fertilizer products focusing Gypsar, Bioferti and Organic Fertilizer. Mr. Kaisar Alam, Product Manager, ACI Fertilizer also joined the program and encouraged the Field Force for doing such promotional program regularly. M/S Khobir Traders, the stockist of ACI Fertilizer appreciated the program and requested to do more group campaigns in the upcoming days.



## Events and Activities

### Professional Training for ACI Motors' Sales Personnel

A training session on professional development for ACI Motors' Sales Personnel was held on 18 May 2015 at Rural Development Authority (RDA), Bogra. The training was on 'Customer Selection, Credit Collection & Monitoring'. CEED Bangladesh in Association with Windmill & SEAF Bangladesh Agriventures Limited arranged the training. The program was funded By United States Department of Agriculture (USDA). In total 25 ACI Motors Sales Personnel from Rangpur, Dinajpur, Bogra, Rajshahi, and Naogaon areas participated in the training.



### Product Knowledge & Selling Skill Training for TMSS

On 19 May 2015, a day-long training session on 'Product Knowledge & Selling Skill Training' was held with TMSS, an NGO. The training took place at Rural Development Authority (RDA), Bogra where 43 of TMSS branch heads participated. ACI Motors Business Director - Mr. Subrata Ranjan Das, along with GM-Sales, PM were also present during the session. A brief presentation on ACI

Tractor, Power Tiller, and Reaper was made which included product description, advantage, market scenario, price, selling procedure, warranty etc. Later all portfolio managers of Tractor, Power Tiller, and Reaper conducted short training there. With the help of ACI Training Department, sales skill training was also arranged for all the participants.



## Events and Activities

### Field Days held under Climate Smart Sustainable Agriculture Project

Two fields day on vegetable and cereal took place at Patuakhali on 19 & 21 April 2015,, where ACI in collaboration with Innovation Against Poverty (IAP) Program of the Swedish International Development Cooperation Agency (SIDA) has been funding a project to promote climate smart sustainable agriculture. The southern districts of Barisal, Borguna and Patuakhali are covered under the project.

One of the crops introduced to the farmers through the project was Mung Bean as it is a short duration crop and can be harvested within 60-65 days. Mung Bean also requires low irrigation and can lead to higher yields if sown in rows instead of broadcasting. Apart from being a protein source for human consumption, the crop also increases soil fertility through its ability to fix atmospheric nitrogen. These benefits were highlighted to all 110 participating farmers during the field day. The response from farmers was positive since it can become a source of extra income requiring low investment and time.



### Post-harvest Training made Farming Efficient

During May 2015, ACI Cropex arranged several post-harvest management training on Maize, Fish, Fruits and Vegetables for improving the skills of farmers in Jessore, Khulna, Satkhira, Chuadanga districts. This training was held in collaboration with Katalyst and Swisscontact. ACI Cropex reached about 3000 farmers around the country

in this month. Md. Mustafizur Rahman, Marketing Manager, ACI Cropex said, "In addition to create a market linkage we are trying to enrich the life of our farmers by providing them with the knowledge of post-harvest management system".



## Events and Activities

### 675 Field Demo motivated farmers in May

With a goal for introducing better, more sustainable varieties of crops, a total of 675 demonstrations has been executed in 13 PDS territories of ACI Seed in May 2015. There are almost 58 varieties of 20 different Crops. Some of these varieties are Super King (Ash Gourd), Mashranga (Bitter Gourd), Rownok (Bottle Gourd), Sweet Emperor (Water Melon) etc. These Demonstrations have been carried out in 39 different districts. The districts are Bagerhat, Barguna, Barisal, Brammon Baria, Bogra, Bhola, Chandpur, Chittagong, Chuadanga, Comilla, Dinajpur, Faridpur, Gaibandha, Gazipur, Gopalganj, Jessore, Jhenaidah, Joypurhat, Khagrachari, Kurigram, Lalmonirhat, Magura, Meherpur,

Munshigonj, Naogan, Narail, Narayengonj, Narshindi, Natore, Pabna, Panchagarh, Patuakhali, Rajshahi, Rangamati, Rajbari, Rangpur, Sirajgonj, and Thakurgaon.

These demonstrations have created quite an impression. The results have encouraged the farmers, dealers, retailers and other stakeholders in and around the areas to cultivate and deal in these varieties. Moreover, these demonstrations are playing a very effective role in the massive promotion of the varieties and so the varieties are successfully dominating the markets as big sellers across the country.



Cauliflower Maradona at Pabna



Pumpkin Dhaka 1 at Thakurgaon



Maize 3033 at Naogan



Cabbage Tropical 33 at Dinajpur

## Events and Activities

### Newly installed submersible water pump to aid research at Rajshahi

On 3 May 2015, The Institute of Biological Sciences (IBSc), Rajshahi University took a generous initiative and installed a submersible water pump to carry out the research programs successfully. On 4 May 2015, Dr. Tanzima Yasmin, Director of IBSc inaugurated the water pump and visited the ACI-RU innovation center. After observation, she gave important suggestions and advice

to continue research progress successfully. With the pump installed, now they can irrigate the research plots adequately. It has facilitated this research to a great extent. It is expected that scientific research would be accelerated for a more sustainable and economic cultivation through such initiatives.



### Framer's Success triggered Rownok cultivation at Rajshahi

A farmer of Paba upazila, Rajshahi has recently induced enthusiasm among many other farmers in the region to grow summer bottle gourd by making a hefty profit from last year's production. Motaleb Hossain (27), a demo farmer of ACI Seed, cultivated the summer hybrid bottle gourd 'Rownok' on 22 decimals of land in his village Paikpara and got net profit of around Tk. 51,000 in 2014. This young farmer, spurred by the grand success, has brought another 2 bighas of land under 'Rownok' cultivation this year. Now he is harvesting fruits on the field at every 2 days interval. 'Rownok' is a heat-tolerant, quick growing research variety that starts fruiting at 55 days after sowing and continues fruiting for another 55 days. It is a pear-shaped variety that yields 30 MT/acre.

In a field survey, the 74 participating farmers from Mota

leb Hossain's neighborhood analyzed the performance of 'Rownok' and were highly motivated to cultivate this variety in their farm next year after seeing the results.

According to Motaleb Hossain, "I, along with many other farmers, marketed our produce in the local market as well as supplied them to Dhaka. So, we were handsomely benefited from the sale ". Thus, due to the growing popularity of 'Rownok', ACI dealer Ms. Hoque Seed Store, experienced about 300% growth in 2015 already. At the same time, the success of cultivating the summer bottle gourd 'Rownok' has spread over the Upazilla Sadar and Mohonpur at Rajshahi. And this indicates that such new varieties will help to attain a concentric development for the country by both modernizing the agricultural development and accelerating the economy.



## Motivation Continued: Seed Field Days reached 2800 people in May

In May 2015, a total of 51 field days were organized by ACI Seed while reaching more than 2800 people in 21 different districts. The field days were held on 19 varieties of 12 different Crops. Some of these varieties were Papiya in Bitter gourd, Marshal Super in Bottle Gourd, Beguni in Brinjal, Maradona in Cauliflower, Eva in Cucumber, Green Soft and Surokkha in Okra, Dhaka-1 in Pumpkin, and Suchona in Sponge Gourd. The districts covered were Barisal, Bhola, Bogra, Comilla, Laxmipur, Chadpur, Chittagong, Chuadanga, Meherpur, Keshore

gonj, Hobigonj, Sunamgonj, Thakurgaon, Dinajpur, Jessore, Kurigram, Gaibandha, Narail, Rajshahi, Pabna, and Rajbari.

In total, near about 2890 farmers, as well as dealers, retailers, and other stakeholders were present in these field days. Among them, about 2484 farmers are highly encouraged and motivated to cultivate these varieties. These field days are continuously playing very effective role in generating value and demand of these varieties in those localities.



Field day-Dhaka-1, Thakurgaon (7 May 15)



Field day-Maradona, Bhola (17 May 15)



Field day-Surokkha, Rajshahi

## Events and Activities

### Innovation beyond Agri Communication

**ACI Fertilizer** recently took an innovative approach for successful agriculture communications as it organized 'Rice Transplantation Program' at Mirzagonj, Patuakhali on 15 May 2015. Mr. Md. Bashir Ahmed, Business Manager, ACI Fertilizer was involved with the program along with his other colleagues. Around 50-60 farmers were present and they also shared their experiences with ACI.



On this occasion, **ACI Motors** has also promoted its Centrifugal Pump 3" X 3" (SL) which is suitable for surface water irrigation. The pump was made with cost-effective, low fuel-consuming ACI 5 HP engine. The efficiency of the pump is about 40000 lit/hours which can irrigate up to 6.6 Ac of land. Spare parts and after sales service facilities also help to build the confidence of the users. Moreover, this pump helps them to prepare mainland for transplantation in time.



**ACI Fertilizer** also provided solution of micronutrients deficiency in soil and helped them to understand the importance of micronutrients and how ACI organic fertilizer: Gypsar, Boric Acid: Bumper Boron, Heptazinc can help them along with other basic fertilizers. Local farmers were not aware of the modern agricultural innovations. Most of the farmers cultivated rice which was rainfed. Because of the rainfed agriculture they have to scramble for rainwater rather than the entire process of cultivation. Transplanting was interrupted and they had lost the productivity of crops. Moreover, they were also not well-informed about the importance of quality seed and importance of micronutrients. So, farmers' community highly appreciated ACI management for arranging such an innovative program and making them aware of modern agricultural innovations.



**ACI Seed** has promoted its newly introduced transplanted AUS variety called BRR1 Dhan48 by providing free seed. The variety is having around 110 day's duration and generating a yield of 5MT/ha. BRR1 Dhan48 seedlings were transplanted during the program.



### Plant Gene Required during High Temperatures Identified

Researchers have discovered a new gene that enables plants to regulate their growth in different temperatures. Published in PLoS Genetics, the finding could lead to new ways of optimizing plant growth when it comes to climate change. Associate Professor Sureshkumar Balasubramanian, from Monash University, along with colleagues in Spain, made the discovery after analyzing natural populations of the model plant *Arabidopsis thaliana*, commonly known as thale cress.

By analyzing the growth responses of *Arabidopsis thaliana* population at different temperatures, the gene ICARUS1 has been identified as the one responsible for the plant growth at increasing temperatures. *A. thaliana* lacking this gene inhibited their growth during high temperatures and resume their growth once the temperature goes down and gets cooler. ICARUS1 is not only found in *A. thaliana*, but in other plants as well. The discovery of this gene will help scientists in developing plants that can tolerate increasing temperatures.

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

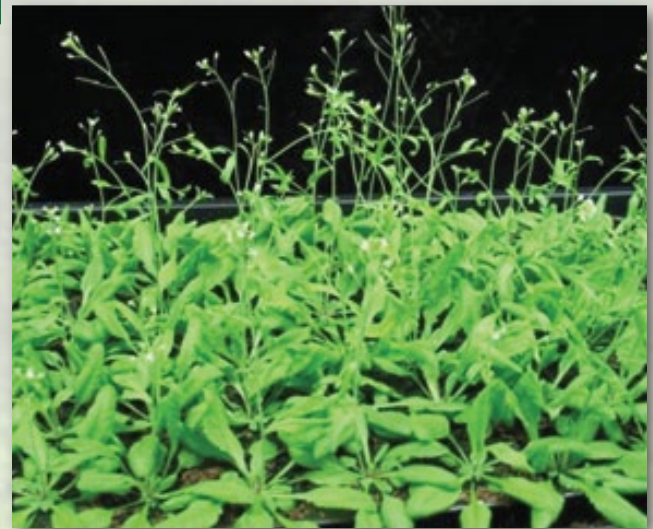


Photo: *Arabidopsis thaliana*

### Threats to soil productivity threaten food security

A group of leading soil scientists, including the University of Delaware's Donald L. Sparks, has summarized the precarious state of the world's soil resources and the possible ramifications for human security in a paper published Thursday, May 7, in the journal Science.

In a review of recent scientific literature, the article, titled "Soil and Human Security in the 21st Century," outlines threats to soil productivity -- and, in turn, food production -- due to soil erosion, nutrient exhaustion, urbanization and climate change. "Soil is our planet's epidermis," said Sparks, echoing the opening line of the article. "It's only about a meter thick, on average, but it plays an absolutely crucial life-support role that we often take for granted." Sparks and his five co-authors, who are also members of the national committee or leaders of soil science societies, wrote the paper to call attention to the need to better manage Earth's soils during 2015, the International Year of Soils as declared by the United Nations General Assembly.

"Historically, humans have been disturbing the soil since the advent of agriculture approximately 10,000 years ago," Sparks said. "We have now reached the point where about 40 percent of Earth's terrestrial surface is used for agricultural purposes. Another large and rapidly expanding portion is urbanized. We're already using the most productive land, and the remainder is likely to be much less useful in feeding our growing population."

(Source: Agriculture and Food News, ScienceDaily. [www.sciencedaily.com](http://www.sciencedaily.com))





### Plant breeder boosts soybean diversity, develops soybean rust-resistant plant

It took decades of painstaking work, but research geneticist Ram Singh managed to cross a popular soybean variety ("Dwight" *Glycine max*) with a related wild perennial plant that grows like a weed in Australia, producing the first fertile soybean plants that are resistant to soybean rust, soybean cyst nematode and other pathogens of soy. Singh works in the Soybean/Maize Germplasm, Pathology and Genetics Research unit in the department of crop sciences at the University of Illinois at Urbana-Champaign. The unit is a division of the U.S. Department of Agriculture's Agricultural Research Program.

His efforts to introduce the desirable attributes of wild, perennial *Glycine* species into soybean plants began at the U. of I. in 1983 and followed a path that involved thousands of experiments, the development of a hormone treatment that "rescued" immature hybrid seeds from sterility, and multiple back-crosses of hybrid plants with their "recurrent parent," Dwight.

(Source: Agriculture and Food News, ScienceDaily. [www.sciencedaily.com](http://www.sciencedaily.com))



Photo Credit: L. Brian Stauffer

### Research Finds Mechanism of Herbicide Resistance

Researchers from the University of Adelaide have identified the mechanism behind the resistance of the cereal weed brome grass to the widely used herbicide glyphosate. The researchers said that it is the first weed species in Australia to have shown this mechanism of resistance.

Resistance to glyphosate has been found in recent years in two different populations of great brome. Both populations showed the same mechanism of resistance called gene amplification, where the resistant plant produces numbers of copies of the gene responsible for EPSPS, the enzyme which is targeted by glyphosate. More enzyme production overcomes the herbicide action.

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



### Indigenous farming methods key for food security in Asia Pacific

Indigenous farming methods have a key role to play in achieving food security, FAO has announced. Speaking at a three-day workshop on Globally Important Agricultural Heritage Systems (GIAHS) for Asia and the Pacific, the UN Food and Agriculture Organization (FAO)'s assistant director-general Hiroyuki Konuma said that the organization had designated 32 GIAHS sites in 14 countries worldwide, including many in Asia. "For centuries, farmers, fishers and pastoralists across Asia and the Pacific have, by necessity of their own survival, developed and/or inherited their own farming practices and adapted in ingenious ways, to meet their subsistence needs in the midst of environmental variability without depending much on modern agricultural technologies," noted Konuma. While innovation will be important in ensuring future food security in the region, existing methods had been honed over centuries, with many boasting the considerable added advantage of sustainability, the FAO executive added.

(Source: Far Eastern Agriculture, [www.fareasternagriculture.com](http://www.fareasternagriculture.com))



Photo: The mountain rice terrace agro-systems of Southeast Asia are one of the FAO's designated GIAHS. (Source: Pandu Adnyana/Flickr)

### Size of domestic animals has increased over time

A new study shows successive changes in the size of domestic animals over time relating to changes in the landscape and production systems. Zooarchaeology is a discipline that studies the relationship between human beings and animals throughout history. To do this, zooarchaeologists study the remains of animals found in archaeological sites. This discipline studies questions relating to livestock husbandry, food or the ritual use of animals, among other things.

The paper "Livestock management in Spain from Roman to post-medieval times: a biometrical analysis of cattle, sheep/goat and pig" is the outcome of the PhD research work conducted by Idoia Grau-Sologestoa and completed in 2014 at the UPV/EHU, and has been published recently in the Journal of Archaeological Science, which specializes in archaeology. It is an analysis of metric data taken from the remains of domestic animals (cows, sheep and pigs) salvaged on archaeological sites across the Iberian Peninsula. The measurements analyzed (numbering over 2,500) come from 41 archaeological sites dating between the Roman era and today, since the 1st century BCE until the 21st century. Many of these sites are located in the Basque Country, but also in Aragón, Castillay León, Catalonia, Madrid, Murcia, Navarre, Valencia and the south of Portugal.

(Source: Agriculture and Food News, Science Daily. [www.sciencedaily.com](http://www.sciencedaily.com))



Photo: These are some of the bones used in the research.  
Credit: UPV/EHU

### First beef with the goodness of fish

Chinese scientists have reared beef rich in the beneficial fatty acids associated with fish oils. The study in Springer's journal Biotechnology Letters also highlights the scientific challenges that remain. The team from Northwest A&F University and the National Beef Cattle Improvement Centre, both in Yangling (Shaanxi), successfully introduced a gene into fetal cells from Luxi Yellow cattle, a Chinese breed with a high beef yield. The fat1 gene, isolated from a nematode worm, codes for desaturase enzymes that are involved in the conversion of n-6 to n-3 polyunsaturated fatty acids.

"We have provided the first evidence that it is possible to create a new breed of cattle with higher nutritional value in terms of their fatty acid composition," says corresponding author Linsen Zan from the College of Animal Science and Technology at the university.

(Source: Agriculture and Food News, Science Daily. [www.sciencedaily.com](http://www.sciencedaily.com))



### Fresh milk, off the grid

Milk preservation depends upon refrigeration and boiling, but in developing countries these methods are costly and often impractical due to the sporadic availability of continuous electricity. A new research of Tel Aviv University now finds that short pulsed electric fields can be used to kill milk-contaminating bacteria. Through a process called electroporation, bacterial cell membranes are selectively damaged. According to lead investigator Dr. Alexander Golberg, of TAU's Porter School of Environmental Studies, applying this process intermittently prevents bacteria proliferation in stored milk, potentially increasing its shelf life.

According to the study, pulsed electric fields, an emerging technology in the food industry that has been shown to effectively kill multiple food-borne microorganisms, could provide an alternative, non-thermal pasteurization process. The stored milk is periodically exposed to high-voltage, short pulsed electric fields that kill the bacteria. The energy required can come from conventional sources or from the sun. The technology is three times more energy-efficient than boiling and almost twice as energy efficient as refrigeration.

(Source: Agriculture and Food News, Science Daily. [www.sciencedaily.com](http://www.sciencedaily.com))





### Believe it or not!



In one day, a **honey bee** can pollinate up to 10,000 flowers!

There are over 500 different types of **bananas** in the world.



**Lettuce** is a member of the sunflower family.

Fresh **apples** float because 25 percent of their volume is air.



We are eating 900% more **broccoli** than we did 20 years ago!



### Calorie Chart

Fresh Fruits		
Food Type	Quantity	Calories (Kcals.)
Mango	113 gm	75
Watermelon	280 gm	80
Lemon	58 gm	15
Guava	113 gm	57
Strawberries	147 gm	50

Sources: [www.fda.gov](http://www.fda.gov) & [recipes.albertarose.org](http://recipes.albertarose.org)

## Agro Tips

A homestead garden is usually intended to utilize the space around a house to grow vegetables and limited food crops. If you have some free space around your house, you may try homestead gardening. It will serve both your hobby of gardening and your family's nutritional need from fresh vegetables.

Here are some simple but valuable tips for starting a homestead garden:

1. **Start Small:** As a starter garden, a small area will be enough to teach you the basic things about growing plants and learning to improve.
2. **Get to know your soil:** Soil is composed of varying percentages of sand, clay, and other organic matters. Getting to know your soil will help you determine the type of plants that are appropriate for your soil.
3. **Be familiar with your climate:** Know your climate and custom-tailor the plants you'll grow to fit the climate. This will increase their chances of survival.
4. **Avoid unnecessary expenses:** Keep your expenses low by not buying things you do not need yet. As a small garden, you will not need many tools.
5. **Learn how to improve:** Some of the best homestead tools and devices around aren't for sale in any store. And some of the best farming tricks are not written in any book or article. They are conceived and tested by none other than you.

## Sharing is caring!

Plastic bottles have become a matter of concern for our environment and sustainability. Experts are continuously emphasizing on reusing and recycling bottles to save our environment. However, recycling may require more technological tools. Luckily, reusing is comparatively easy to practice. Here is an idea to reuse plastic bottles. If you have a garden and like to have birds flying in it, a good idea is to place some creative bird's feeder using plastic bottles. One idea is using some wood spoons dovetailed in the bottle. Make small holes and insert the spoons by the cable side. Fill the bottle with bird's food and let it slip in the spoon. You can also use chopsticks instead of wood spoons but the holes in the bottle must be bigger to make birds access to food easier. Now only hang the feeder in a tree and wait for the birds!



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### ACI Agribusinesses

*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.