

BIO LIFE

Letter from Executive Director, Agribusiness

Volume 01 Issue 41 October 2015

GIS - an Emerging ICT Application in Agribusiness

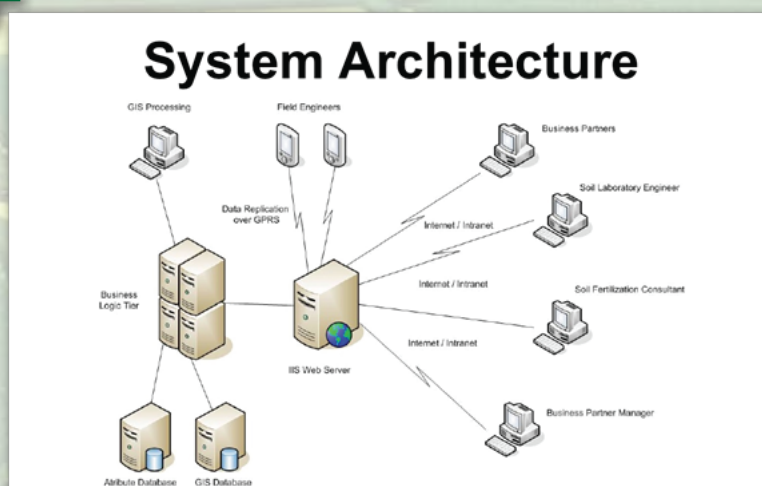
Geographic Information System (GIS) is designed to capture, store, manipulate, analyze, manage, and present all types of spatial or geographical data. GIS helps visualize, question, analyze, and interpret data to understand relationships, patterns, and trends. That is why GIS has been widely used as a base for rational planning in agribusiness around the globe.

When it comes to agribusiness, balancing the inputs and outputs of a farm is fundamental to its success and profitability. The ability of GIS to analyze and visualize agricultural environments and workflows has proven to deliver great value to agribusiness and the farming industry. From mobile GIS in the field to the scientific analysis of production data at the farm manager's office, GIS for ACI agribusiness and agriculture production is enabling farmers first time in Bangladesh to increase production, reduce costs, enhance food security and manage their land more efficiently.

Technically, cutting-edge imagery and smart mapping technology are at the heart of the program, which enables farmers to accurately forecast harvest yields and predict crop disease outbreaks. By utilising Geographic Information System (GIS) technology, farmers can access interactive maps that incorporate satellite imagery and other real-time data such as soil, irrigation, pest and nutrient conditions. From this data, growers can analyze the health and maturity of their crops; develop and shift farming strategies; and submit detailed reports to industry stakeholders from anywhere on the farm.

From an organizational perspective, GIS unleashes the power of mapping by cost savings from greater efficiency, better decision making, improved communication, and better record keeping. To maximize profits and optimize our yield, we need to dedicate the right crops and equipment to the places where they can flourish. With GIS, we can integrate high-resolution imagery, field observations, and real-time data feeds to understand how to make the most of our limited resources at any time.

Dr. F H Ansarey
Executive Director
ACI Agribusiness



A sample GIS implementation for Agribusiness

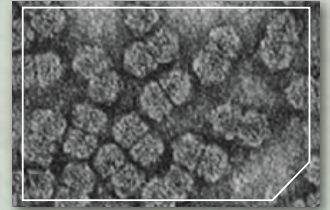
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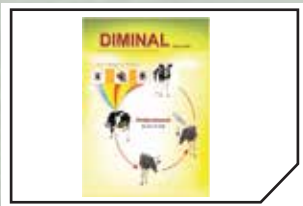
Tomato Yellow Leaf Curl Virus (TYLCV): An overview

Tomato (*Lycopersicon esculentum* L.) is one of the most widely grown vegetables in the world grown for its edible fruit.



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Diminal



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ACI motors organized SPARK conference in Cox's Bazaar from 3-5 September.



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Biodiversity Belowground as Important as Above



Although most of the world's biodiversity is below ground, surprisingly little is known about how it affects ecosystems or how it will be affected by climate change.

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Tomato Yellow Leaf Curl Virus (TYLCV): An overview

Prof. Lutfur Rahman

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

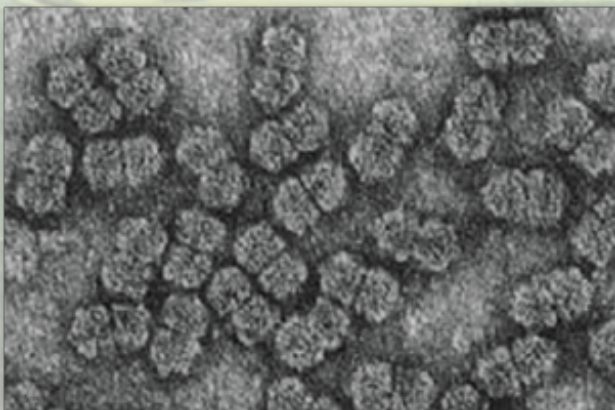
Tomato (*Lycopersicon esculentum* L.) is one of the most widely grown vegetables in the world grown for its edible fruit. The cultivated tomato originates from wild plants found in the Andean regions of Chile and Peru. Now, tomato occupies a significant position in World vegetable production due to its world-wide adaptation and consumption. Tomato Yellow Leaf Curl (TYLC) is one of the most devastating viral diseases of cultivated tomato in tropical and subtropical regions worldwide, and losses of up to 100% are frequent. In many regions, TYLC is the main limiting factor in tomato production. TYLCV belongs to the family Geminiviridae, genus Begomovirus, and transmitted by the whitefly *Bemisia tabaci*. Begomoviruses are small, circular, single stranded DNA plant viruses. Tomato Yellow leaf curl disease (TYLCD) symptoms consist of a more or less prominent upward curling of leaflet margins, reduction of leaflet area and yellowing of young leaves, together with stunting and flower abortion.

Transgenic approaches used for controlling TYLCV

Approximately 30 begomoviruses are reported as pathogens of tomato. However, transgenic approaches have been used so far in attempts to control only a few of them, mainly ToMoV, TYLCV, Tomato yellow leaf curl Sardinia virus (TYLCSV), Tomato golden mosaic virus (TGMV), and Pepper huasteco virus (PHV). Most of the efforts have been directed toward the control of TYLCV which is considered the most important tomato-infecting begomoviruses in several countries. However, most of those studies have been carried out on *N. tabacum* or *N. benthamiana* plants, and only a few transgenic tomato lines have been produced that are resistant. Several viral sequences have been used in attempts to obtain plants resistant to tomato-infecting begomoviruses, with results that vary from immunity to complete susceptibility.

Traditional breeding for resistance to TYLCV

Breeding disease-resistant varieties is the most economic and efficient method for controlling TYLCV in tomato. However, no TYLCV-resistant gene resources exist in cultivated tomato cultivars but wild tomato species such as *Solanum pimpinellifolium*, *S. peruvianum*, *S. chilense*, *S. habrochaites*, and *S. cheesmaniae* exhibit a high degree of disease resistance. A total of 6 tomato TYLCV resistant genes have been identified and named as Ty-1, Ty-2, Ty-3, Ty-4, Ty-5, and Ty-6. These disease-resistant genes were derived from different wild-type tomatoes. The Ty-2 gene has been shown to exhibit clear resistance to TYLCV in India, Taiwan, Japan, and other Asian regions and has been widely used for TYLCV-resistance breeding in tomato. Resistant gene Ty-2 identified from the *S. habrochaites* accession B6013 was mapped at the chromosome 11. Traditionally, the development of a new variety with resistance to TYLCV disease involves crossing a superior, susceptible breeding line with a resistance source (donor). Superior, resistant progeny are advanced and backcrossed to a superior, susceptible breeding line (recurrent parent). This process takes considerable effort and time, as it is repeated until the horticultural characteristics of the superior line are combined satisfactorily with the resistance of the donor. This integration will be greatly simplified by the marker-directed transfer of each trait into a common set of commercially acceptable fresh market tomato breeding lines.



Purified begomovirus particles



TYLC induced diseased symptoms on tomato plants

Innovations and New Products

Diminal

ACI animal health has brought up a new injection 'DIMINAL' for protection and treatment of cows from Protozoa. It is a combination of Diminazene diaceturate and Phenazone. Diminal injection is an effective antiprotozoal drug for the treatment of trypanosomiasis, babesiosis and Theileriasis. Each 1g of this injection contains Diminazene diaceturate 445 mg and Phenazone 555 mg. The preparation of this injection is very easy and anyone can use it by reading the instruction. Four easy steps are to be followed which is on the back of the packet. The injection should be administered intramuscular route and the syringe should be discarded after using.

DIMINAL INJECTION
Diminazene diaceturate + Phenazone

Best Treatment for Protozoa

Antiprotozoal INJECTION

Description:
Diminal Injection is an effective antiprotozoal drug for the treatment of trypanosomiasis, babesiosis and Theileriasis.

Composition:
Each 1g contains
Diminazene diaceturate 445 mg
Phenazone 555 mg

Indications:
Trypanosomiasis:
Trypanosoma vivax, Trypanosoma evansi and Trypanosoma congolense.
Babesiosis:
Babesia bovis, Babesia biguttata, Babesia microti, Babesia motus and other species of Babesia.
Theileriasis:
Theileria annulata.

How to prepare diminal injection:
Step 1: Collect one (1) ml of distilled water in the syringe.
Step 2: Remove the piston and the needle of the syringe. Inverted the syringe by the tip of the finger and captured the back side of the syringe.
Step 3: Cut the rubber through marked area by the constant stress.
Step 4: Take 15 ml of distilled water in the syringe add the medicine into it. In the piston with the syringe and shake well. Now the mixture is ready for injection.

dosage & Administration:
The injection should be administered intramuscular route as following dosage and after use the syringe should be discarded.
1.0 to 2.0 kg BW 1.0 ml
2.0 to 5.0 kg BW 1.5 ml
5.0 to 10.0 kg BW 2.0 ml
10.0 to 20.0 kg BW 3.0 ml
20.0 kg and above 4.0 ml

Storage:
Store in a cool & dry place protected from light. Keep out of reach of children.

Manufactured by:
ACI ANIMAL HEALTH (INDIA) PRIVATE LIMITED
Plot No. 10, Sector 10, Gurgaon, Haryana, India

For Veterinary Use Only

Marketed by:
ACI Animal Health

Ig lock gold

ACI animal health has brought new product for increasing Calf immunity against different diseases. This new product is manufactured by Dan Biotech Inc Korea and marketed by ACI Animal Health. This product is hoped to save calves from diarrhea, increase lactic acid bacteria in the intestine and reinforce immunity. Each 10g syringe contains Egg Yolk powder (IgY) 3.9g, Fructo-Oligosaccharides 0.6g and Excipient q.s. to 10g. The user description is provided at the back of the package or can be used as the veterinary physicians suggest.

DAN + IgLock Gold

IgLock Gold
Calf immunity reinforcement

বাহুরের মৃত্যুর হার লক করে . .

Events and Activities

PDS Field School at ACI & RU Innovation Center



On 13 September 2015 PDS team including Mr. Shapon Chandra Roy (PDSO, Thakurgaon), Mr. Samiul Islam (PDSO, Bogra), Mr. Faruk Ahmed (PDSO, Gazipur), Mr. Tanvir Ahmed (MO, ACI-IBSc and RU Innovation Center) and Assistant PDS Manager Dr. Mohammad Muhebbullah Ibne Hoque visited ACI & RU innovation Center. Assistant PDS Manager briefly discussed about crop production management of different existing trial crops scientifically as well as how data to be collected and recorded from the trial plot scientifically to evaluate the yield performance for screening better crop varieties. The PDS officers also exchanged their experiences on crop production techniques and management to improve their knowledge. The Farm personnel of ACI & RU innovation center described farm activities and management. This can be noted as a practical “on job coaching” which is really a helpful and useful programme to improve job knowledge.



Adaptive Trial: Research with Farmers



Experimentation is a set of procedures by which the best potential new technologies that address identified constraints or opportunities are tested. Unlike formal experimentation (that is largely undertaken by researchers) farmer experimentation involves farmer participation at different levels of testing and often undertaken on farmers' fields. Conducting adaptive trials in farmers' land is the core technical job of ACI Seed's PDS Unit. PDS unit has taken a great initiative to set scientific experiments in farmers' land for selection of new materials.

Farmers are the ultimate beneficiaries of the outputs of research programs. In the last few decades researchers developed technologies which were not appropriate for many farmers' situations and circumstances. As a result impact of new technologies at the farmer level has been nominal. One of the reasons has been the low level of farmer involvement in agricultural research.

Keeping these in mind, ACI's PDS conducting scientific trials in 8 stations namely Thakurgaon, Rajshahi, Jessore, Patuakhali, Comilla, Gazipur, Bogra and Chittagong which covers 7 common AEZs i.e. Old Himalayan Piedmont Plain and Tista Floodplain (1, 2, 3, 27); Korotoya Flood Plain and Atrai Basin (4, 5, 6, 25, 26); High Ganges River Floodplain (11, 14); Ganges Tista Floodplain (13); Middle Meghna River Floodplain (16, 30, minor 17, 19, 22); Greater Dhaka (15, minor 7, 8, 28); Chittagong Coastal Floodplain and St. Martin Coral Island (23, 24) and 23 AEZs in broad sense. Farmers are directly involved for conducting adaptive trials in scientific way. On 08 September 2015 Asst. PDS Manager Dr. Mohammad Muhebbullah Ibne Hoque visited the trial plots at Thakurgaon PDS Station along with PDS Officer Shapon Chandra Roy and trial farmer Md. Abdur Razzaque of the village of Daspara, Thakurgaon Sadar.



Figure: Cabbage & Cauliflower Trial Plots in Farmer's Land at Thakurgaon PDS Station

Events and Activities

Attending in Regional Workshop under Integrated Agricultural Productivity Project (IAPP) at Barisal

ACI Fertilizer participated in regional workshop under Integrated Agricultural Productivity Project (IAPP) at district welfare office, Barisal dated on 9th September 2015 which was organized by IAPP Project under the Ministry of Agriculture and Ministry of Fisheries & Livestock. The main objective of participation in this program was to strengthen the partnership with DAE and to generate the sales. There is a plan to sell Tk. 30 Million in upcoming Boro season under IAPP project.

The number of participants was 200 from ACI Fertilizer, IAPP Project, DD, Upazilla Agriculture, Fisheries & Livestock Office. Mr. Abdul Kader, Joint Secretary & Project Director of IAPP was present as a chief guest & Mr. Ariful Islam, Project Coordinator; IAPP was present from IAPP Project. Mr. Sarder Ali Mortuza, General Sales Manager, ACI Fertilizer gave his valuable speech regarding how ACI Fertilizer will participate with the project activities. Mr. Zillur Rahman Khan, Regional Sales Manager; Mr. Arifur Rahman, Asst. Manager, Institution Sales; Md. Nuruzzaman, Area Executive and Marketing Officers were present on that workshop from ACI Fertilizer.



Organized Retailer Training Program (RTP) at Dimla, Nilphamari

ACI Fertilizer organized a Retailer Training Program at Upazilla Auditorium, Dimla, Nilphamari dated on 17th September 2015. The main objectives of the program were to create awareness among the retailers about our product's quality, price & benefits. Mr. Sarder Ali Mortuza, General Sales Manager, ACI Fertilizer was present as chief guest & presented training session for the retailers to motivate for more selling. Mr. Firoz Hossain, Zonal Sales Manager; Mr. Nazrul Islam, Area Executive were also present on the training program.



Events and Activities

Organized a Discussion Session With Tea Garden Owner Association at Panchagarh

ACI Fertilizer Organized a discussion session for tea garden owner association at Panchagarh dated on 17th September 2015. The main objectives of the program were to create awareness among tea garden owners to use ACI Fertilizer products for better tea production in their garden. The focused product on discussion session was Organic Fertilizer, Gypsar, Tea special Bioferti, Monozinc, Root Grow, Chelated Zinc etc.

Mr. Sarder Ali Mortuza, General Sales Manager, ACI Fertilizer was present as chief guest & Key speaker on the session for the owner to motivate for buying more. Mr. Firoz Hossain, Zonal Sales Manager; Mr. Rezaul Islam, Area Manager were also present on the training program. 30 tea garden owners were present on the discussion session.



Participated at Promotional Program of Small Farmers Development Foundation (SFDF) at Pabna District

ACI Fertilizer has participated in three promotional program of Small Farmers Development Foundation (SFDF) at Pabna Sadar, Sujanagor & Bera Upazilla under Pabna district dated on 12th September 2015. The main objectives for participation on this program were to get competitive advantage from the market by promoting & selling our products to the farmers. Bank Asia, SFDF and ACI Limited made a MOU among them to give easy loan & quality input to the farmers for better crop production.

“**Small Farmers Development Foundation**” (SFDF) is working with the landless male & female members, marginal & small farmer families living in rural areas in order to enable them to gain access to resources of their self-undertake activities of income generation and poverty alleviation.

Mr. A H M Abdulllah, Additional Secretary-PRL & Managing Director-SFDF was present as a chief guest and Mr. Arfan Ali, Deputy Managing Director; Bank Asia was present as a special guest of the program. Mr. Bashir Ahmed, Business Manager, ACI Fertilizer gave valuable speech from ACI Limited. Mr. Mizanur Rahman, UNO; Mr. Shahidul Islam, Manager, Issordi branch, Bank Asia; Mr. Shahed Al Amin, Assistant Sales Manager, ACI Motors; Mr. Rayhanul Rahman, Manager-SFDF, Bera Upazilla; and many other govt. high officials, officers of Bank Asia & local administration were also present on this program



Events and Activities

SPARK conference for sells

ACI motors organized SPARK conference in Cox's Bazaar from 3-5 September. The main objective of this conference was to make a plan to hit a target of 500 unit sell in the last quarter of this year 2015. In this conference all teams of ACI Motors were present besides this High officials from Agribusiness and regional Sales Heads were present. New plan for sales increment were proposed as well as different strategies for marketing were presented in this conference.



Service Training in Bogra

After sales service is as important as selling a good product. Farmers want better care when the face problem with their accessories. Keeping this in mind ACI Motors organized a training program for all the service engineers in Bogra. General Manager Eng Asif Uddin was the main guest in this program and he trained the service engineers how to provide good service to the customers. In this meeting, engineers from service sector presented their plan for the next four months on after sales service.



Events and Activities

Demonstration of new Rotavator (SONALIKA SMART Series)

ACI Motors has successfully tested its new Tractor SONALIKA SMART Series on 16th September 2015 in Faridpur. It was a successful attempt and it has been believed that this new Machine will get enough response from the farmers. It is to be mentioned that, the main manufacturer of this tractor is International Tractor Limited who are the supplier of this machine was unable to provide Rotavator before but now they have successfully made it. It is very smart and efficient and hoped to fulfil the expectation of the farmers



Agri-tech & Communication

Biodiversity Belowground as Important as Above



Although most of the world's biodiversity is below ground, surprisingly little is known about how it affects ecosystems or how it will be affected by climate change. A new study demonstrates that soil bacteria and the richness of animal species belowground play a key role in regulating a whole suite of ecosystem functions on Earth. The authors call for far more attention to this overlooked world of worms, bugs and bacteria in the soil.

Ecosystem functions such as carbon storage and the availability of nutrients are linked to the bugs, bacteria and other microscopic organisms that occur in the soil. In fact, as much as 32% of the variation seen in ecosystem functions can be explained by the biodiversity in the soil. In comparison, plant biodiversity accounts for 42%. That is the conclusions of a new study published in Nature Communications led by Peking University and the Center for Macroecology, Evolution and Climate at the University of Copenhagen.

"Biodiversity below ground is neither very visible nor very cute, but pick up a handful of soil and you might find more species there than all of the vertebrates on the planet. We need to turn our attention towards these organisms, if we are to better understand the ecosystems we depend on for a range of functions," says co-author Aimée Classen from the Center for Macroecology, Evolution and Climate.

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



The Tibetan Plateau in China was chosen as a study site for its extensive variation in climate. Photo Credit: Xin Jing, Peking University

High Protein Foods Boost Cardiovascular Health



Eating foods rich in amino acids could be as good for your heart as stopping smoking or getting more exercise -- according to new research from the University of East Anglia (UEA). A new study published today reveals that people who eat high levels of certain amino acids found in meat and plant-based protein have lower blood pressure and arterial stiffness.

And the magnitude of the association is similar to those previously reported for lifestyle risk factors including salt intake, physical activity, alcohol consumption and smoking. Researchers investigated the effect of seven amino acids on cardiovascular health among almost 2,000 women with a healthy BMI. Data came from TwinsUK -- the biggest UK adult twin registry of 12,000 twins which is used to study the genetic and environmental causes of age related disease. They studied their diet and compared it to clinical measures of blood pressure and blood vessel thickness and stiffness. They found strong evidence that those who consumed the highest amounts of amino acids had lower measures of blood pressure and arterial stiffness. But they found that the food source was important -- with a higher intake of amino acids from plant-based sources associated with lower blood pressure, and a higher intake from animal sources associated with lower levels of arterial stiffness. Lead researcher Dr. Amy Jennings, from UEA's Norwich Medical School, said: "This research shows a protective effect of several amino acids on cardiovascular health."

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



A higher intake of protein from animal sources was linked with lower levels of arterial stiffness. Photo Credit: Africa Studio / Fotolia

Agri-tech & Communication

Gene Stacking Provides Better Resistance in Potato against Late Blight

Scientists from Ghent University, VIB, Institute for Agricultural and Fisheries Research (ILVO) and partners released the results of their GM potato field study in the journal *Crop Protection*. The field trials of GM potatoes were conducted in Belgium and Netherlands to investigate the efficacy of adding one to three resistance genes in potatoes against late blight caused by *Phytophthora infestans*. Results showed that the tested genes have different contributions to resistance. They have identified a certain stack of genes from *Solanum venturii*, *Solanum stoloniferum* and *Solanum bulbocastanum* that provides the best resistance to late blight.

Based on the findings, the researchers concluded that breeding has to focus on putting together a wide combination of natural resistance genes in new varieties, at least three, but four or five is even better. Also, the resistance genes have to be sufficiently different. For sustainable resistance management, it is necessary to change the combination of genes in the new varieties strategically.

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



What Are the Secrets to Producing More Rice?

Dozens of plastic tubs stacked in a room may look ordinary, but they store what could be the secrets to more rice to feed the world. The containers are the resting place for what's known by scientists as a "core collection," or fraction of all the known varieties of rice on Earth. Yet, even from their plastic vaults housed at the Texas A&M AgriLife Research and Extension Center in Beaumont, these grains are yielding data scientists say will help make better varieties for years to come.

"Beaumont is the only location where the full collection has been grown for the purpose of analyzing the chemical element composition," said Dr. Lee Tarpley, an AgriLife Research plant physiologist, who is using the collection extensively in his studies there. In all, thousands of rice varieties made their way into the collection by way of numerous scientists, who over decades ventured across North and South America, Europe, Africa, Australia and Asia in search of samples, Tarpley said. The seeds most recently were used for a massive study to determine which varieties are most capable of using major nutrients, such as phosphorus or potassium, from the soil.

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



Dr. Lee Tarpley examines some of the 1,700 varieties of rice stored at the Texas A&M AgriLife Research and Extension Center in Beaumont.

Photo Credit: Texas A&M AgriLife Research photo by Kathleen Phillips

Scientists learn how to predict plant size

VIB and UGent scientists have developed a new method which allows them to predict the final size of a plant while it is still a seedling. Thanks to this method, which is based on the knowledge that a set of genes is associated with the final size of a leaf, scientists will be able to significantly accelerate plant breeding programs. The VIB/UGent scientists were able to identify this set of genes through advanced and highly detailed analyses. Expression analysis of specific genes will help breeders select the most useful crossing products at a very early stage.

It takes a long time to develop new strains of plants with a greater yield or greater resistance to disease. Selecting the most useful crossing products, in particular, is a labor-intensive, time-consuming and expensive process. At present, breeding products must be manually infected to determine whether they are disease-resistant, while corn plants must first produce ears before their yield can be determined. This selection process can be made much more efficient by choosing plants on the basis of genetic data rather than on the basis of external characteristics. After all, many external properties are contained in DNA.

Thanks to an improved understanding of how plant growth and development are regulated at the molecular level, it is now known to a large extent which DNA sequences are responsible for which traits. By identifying the presence of such DNA sequences (also known as genetic markers) in seedlings, it is possible to predict at a very early stage whether the fully grown plants will be disease-resistant, even without having to infect the plants. This type of breeding is called marker-assisted breeding. A team of scientists from VIB and UGent, led by Prof. Dirk Inzé, developed a new method designed to predict the size of the leaves of a fully grown corn plant while the plant itself is still a seedling. This method is RNA-based rather than DNA-based.

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



Plants used in this study.
Photo Credit: VIB, 2015

GM Plants could Help Eliminate Food Poisoning

A study led by a team of researchers from German companies Nomad Bioscience and Icon Genetics reveals a new strategy to fight foodborne diseases. The new strategy involved genetically engineering plants to produce antimicrobial proteins, which can then be extracted and applied to contaminated meat and produce.

The team engineered tobacco, beets, spinach, chicory, and lettuce, to produce proteins called colicins, which can kill deadly strains of E. coli. They found that plants such as tobacco can yield high levels of active colicins, and identified a mixture of two colicins that can efficiently kill all major disease-causing strains of E. coli. Colicins are extremely potent, and the scientists believe the proteins could be an economically viable way to treat food. Yuri Gleba, CEO of Nomad Bioscience said, "Colicins are 50 times more active against bacteria than normal antibiotics." In the study,

Gleba and his colleagues sprayed E. coli-laced pork steaks with a mixture of two types of colicins, at 4 milligrams of colicin per kilogram of meat, and found significant reductions in E. coli after just an hour.

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



Agri-tech & Communication

Detecting How Plant Sensors Recognize a Pathogen



John Innes Centre researchers conducted a study identifying how the plants' sensors detect a pathogen protein. This was conducted by observing how rice recognizes the rice blast pathogen. In the study, the binding of Pik, a protein sensor in rice, and AVP-Pik, a rice blast pathogen protein, was observed using X-ray crystallography. Successful images were obtained showing the contact points between the plant sensor and the pathogen protein at the molecular level. Further analysis of the images revealed that the strength of the Pik-sensor binds with the pathogen AVR-Pik protein is associated with the strength of the plant's response. The findings of the study provide new insights on how to better engineer plant responses against pathogens to enhance disease resistance.

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



Climate Change alters Genetic Diversity of Wild Plant Species



University of Liverpool scientists reported in *Global Change Biology* that the genetic diversity of wild plant species can be altered hastily by climate change. They discovered this after studying the genetic responses of various wild plants in the grassland ecosystem near Buxton in England during simulated climate change conditions including drought, enhanced rainfall, and increased temperature, over a period of 15 years.

DNA markers analysis in the wild plants showed that the climate change conditions caused a modification in the genetic composition of the plant populations. It also revealed a process of evolutionary change in one of the species studied, implying that genetic diversity may protect plants from the drastic effects of climate change, causing an "evolutionary rescue."

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





Believe it or not!



Apples are a member of the rose family.

Through about **17,000** tiny pores over its surface, an **egg** can absorb flavors and odors.



Each worker honey **bee** makes 1/12th teaspoon of honey in its lifetime.



Wool is a natural fiber grown from **sheep**.

Each tassel on a **corn** plant releases as many as 5 million grains of pollen.



Calorie Chart

Fresh Food		
Food Type	Quantity	Calories (Kcals.)
Potato	100 gm	97
Onion	Half cup (sliced)	23
Peas	Half cup (fresh boiled)	55
Carrot	Half cup/1 fresh	25
Cucumber	6 slices	5

Source: www.novafeel.com

Agro Tips

Some symptoms of nitrogen deficiency (in absence or low supply) are:

- The chlorophyll content of the plant leaves is reduced which results in pale yellow color. Older leaves turn completely yellow.
- Flowering, fruiting, protein and starch contents are reduced. Reduction in protein results in stunted growth and dormant lateral buds.

Appropriate use of nitrogen type fertilizer (Ammonium Sulphate) may help you to get a better yield.

Readers' Corner

Sharing is Caring!

Living walls are now a growing trend worldwide. They are also referred to as green walls, vertical gardens or in French, mur végétal. The French botanist and artist Patrick Blanc was a pioneer by creating the first vertical garden over 30 years ago. Green walls or living walls are vertical structures that are attached to the exterior or interior of a building. Creeping fig (*Ficus pumila*) vine, also known as fig ivy, creeping ficus and climbing fig, is one of the popular plants used to cover the walls in this regard.

Did you see a nearby 'Living Wall' recently?



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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.