

Rice Transplanting Technology for High Productivity



In Bangladesh, Out of 5.53 million hectares of irrigated crop area about 4.62 million hectares are covered by transplanted rice with manual transplantation practice. In manual transplanting of rice, the cost is 10,591tk per hectare and grain yield (t/ha) is 4:5 whereas in machine transplanting cost is 9,514 tk per hectare and grain yield (t/ha) is 5:1. That means cost can be reduced by 11.32% and yield grain is increased 4.2 (t/ha) through mechanical transplantation.

The main advantage of mechanical rice transplanting is the reduced time required for planting the crop. An acre of field can be transplanted with a

machine in just over an hour compared with 2 days for a manually transplanted field.

ACI Motors, a business unit & subsidiary of ACI Ltd.; is introducing a Rice Transplanter in Bangladesh.

For more Details, please click in followed link:
USAID – CSIS: <http://csisa.org/wp-content/uploads/sites/2/2013/08/CSISA-BD--EoP-Report-.pdf>

Dr. F H Ansarey
Executive Director
ACI Agribusiness



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In October 2016, ACI Field Crops Seed Business arranged 4 technical training programs for its dealers as part of its initiative to transfer knowledge efficiently in rural areas.



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Plant Variety and Farmers Rights/Privilege Protection Act (PVFRPA)

In developing crop varieties in any countries of the world there is need for recognizing that the plant genetic resources are basic resource for development of new varieties for cultivation. In utilizing such resources the knowledge and skills of genetics and plant breeding of today have become very important. The farming community is however the most important working group to collect from both natural and market materials to use for cultivation and use. Both national and international organizations and the government forces have developed many acts and laws to protect such materials of the countries of their own geographical jurisdictions. The resultant is International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA); TRIPS (Trade Related Aspects of Intellectual Property Rights) and the Convention on Biological Diversity (CBD), the third one through article 3 recognizes the sovereign rights of states over their biological resources. While article 8 (j) underlines the need to protect traditional knowledge and points to the potential benefits to be realized from such knowledge through involvement of its holders and equitable benefit – sharing and article 16.2 addresses issues surrounding the access to and transfer of technology, governed by patents. Article 16.5 anticipates the difference in objectives between IPR regimes and the CBD and seeks to ensure that IPRs don't run counter to the CBD. Article 27.3 of TRIPS covers Sui Generis Systems for Plant Variety Protection (i) Protect traditional knowledge relevant to plant genetic resources; (ii) obtain an equitable share of benefits arising from the use of plant genetic resources; (iii) participate in the decision making processes on matters related to the conservation and sustainable use of plant genetic resources; (iv) save, use, exchange and sell farm saved seeds/propagating material; and (v) use new breeders' varieties to develop farmers' varieties. Union for Protection of Plant Varieties (UPOV) provides exclusive rights to the right holder(s) in respect of propagating materials of production or multiplication, condition for the purpose of propagation, offering for sale, selling or other marketing, exporting, importing and stocking. However, there have been some exceptions to Breeders right, particularly on the following conditions: like (i) done privately and for non-commercial purposes; (ii) experimental purposes; (iii) Breeding of other varieties; (iv) Farmers' right to use for propagating purposes, on their own holdings, the product of the harvest as optional exception; and (v) exhaustion of Breeder's right on different conditions again. In the USA there are three patent acts that regulate Plant Variety Protection. These are; utility patents viz., Plant Patent Act, 1930 and Plant Variety Protection (PVP). The Utility Patent and The Plant Patent Acts are granted and governed by the USPTO, while the PVP is granted by the USDA. In the European Union, European Council regulation on Community Plant variety Rights (1994) provides for protection of Plant Varieties provided they are New, Distinct, Uniform and Stable. Protection is provided to the com

munity plant variety right on one application is valid in territory of all EU member states. (i) Farmers' privilege: right to use farm saved seed without breeder's consent. (ii) Breeders' exemptions are for non-commercial purposes and for discovering and developing other varieties. There is exception in patenting between patents and breeders' exemption in case of genetically engineered materials. Indian Protection of Plant Varieties and Farmers' Rights Act, 2002 provide protection for (i) new plant variety, (ii) essentially derived varieties (iii) extant variety and (iv) farmers' variety. In fact it covers all such materials that have been domesticated in the past, being used at the present as developed with or without normal or traditional breeding process rather developed by the farmers and being maintained by them and the varieties that have gone the public domain after the protection period is over, the varieties that will be developed by someone without asking for any protection so and so forth. Criteria for protection of a variety are: Novelty, Distinctness, Uniformity and Stability along with a denomination.

Bangladesh Case: Plant Variety and Farmers Right Protection Act 2014 provides protection for New, Distinct, Uniform and Stable materials of: (i) lowest of the Botanical taxon; (ii) defined by expression of characteristics resulting from a given genotype or combinations of genotypes; (iii) distinguished from any other by at least one characteristic; (iv) considered as unit with regard to propagation w/o any change, (v) PGR/breeding lines developed by incorporating gene either from cultivated or wild; and (vi) created through mutation and used in integrating the trait to a commercial one including transgenics.

Breeders Right: Authorization of the breeder will be required for (i) production and reproduction (multiplication) of his/her protected variety (ii) conditioning for the purpose of propagation (iii) offering for sale selling or otherwise marketing, exporting, importing; and (iv) stocking for any of the above purposes

Farmers Right: (i) Covers sharing of benefits derived in breeding new varieties; (ii) saving seeds for own use; (iii) exchanging seeds with others; and (iv) selling own saved seeds to others (without packaging and giving brand marks).

Plant Variety and Breeder's Right Protection act should be implemented in Bangladesh to encourage variety development by the Private Sector along with the Public. It has been seen worldwide that in countries where such Acts have been implemented, applications for variety release has increased significantly, especially from the private sector. This will provide more options for the farmers to choose seeds required for their unique production situation.

Prof. Lutfur Rahman

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

Pyro-Free

On 9 October 2016, ACI Animal Health launched Pyro-Free. Pyro-Free is an effervescent bolus which is used to treat the pains of different origin and variable intensity (such as tooth-ache, headache, visceral pain or high fever). It is also prescribed for the high fever caused by viral and bacterial infection. Each bolus of Pyro-Free contains Novalgin 1500 mg, Vitamin C 150 mg, Vitamin K 30 mg, and Vitamin E 150 mg. It is effective in controlling and relieving fever. Pyro-Free also helps to relieve the pain of various cause and acts as best supportive therapy during the antibiotics or vaccinations against bacterial and viral diseases. It can be used to relieve from stress conditions, accidental injury and/or post-operative treatments of large animals.



ACI Seed Dealers' Technical Training Program



In October 2016, ACI Field Crops Seed Business arranged 4 technical training programs for its dealers as part of its initiative to transfer knowledge efficiently in rural areas. The training programs held on October 10, 18, 22 and 28 at Habiganj, Mymensingh, Comilla and Khulna respectively covering 120 dealers. The main objectives of this training were to respond to the capacity gaps of the agro-dealers that were identified during the training's needs assessment, to strengthen their business management skills so that they can better manage their businesses as well as poise them for sustained further growth.

Such technical training offered the participants with the opportunity for dealing with ACI Seed products in detail and for further development of their knowledge and skills. The program was facilitated by Mr. Mizanur Rahman, Sales & Marketing Manager (FC).



Business Manager Mr. Sardar Ali Mortuza also attended the programs. Now ACI Field Crops Seed Business is increasing the access of remote, rural smallholder farmers to quality, affordable inputs by creating a network of 120 agro-dealers.

Promising Veg Varieties Demonstrated Countrywide



ACI Vegetable Seed Business arranged result demonstration programs across the country to build trust between the seed dealers and the farmers in October 2016. It arranged 6 programs on October 10, 13, 18, 21, 23 and 27 at Comilla, Satkhira, Mymensingh, Barisal, Gazipur and Thakurgaon respectively covering 150 dealers. The programs used a facilitation approach to bring stakeholders together and explained the mutual benefits of working together to improve the vegetable seed value chain in the region. With these demonstrations, the role of seed dealers was identified as a key player in the vegetable seed value chain for providing agricultural extension services to rural farmers. The program was facilitated by Mr. Abdullah Al Masud, Product Manager (Vegetables) and S. M. Abdul



Mukit, Sales & Marketing Manager (Vegetable) and Business Manager Mr. Sardar Ali Mortuza were attended the programs.

Events and Activities

'Bumper Organic Fertilizer' launched in 3 Regions

In October 2016, ACI Fertilizer launched its own brand 'Bumper Organic Fertilizer' in Comilla, Chittagong and Rajshahi regions. The launching program held on 16 October at Comilla City Club Conference Room, on 17 October at Hotel tower Inn., Chittagong, and on 20 October at Ashroy Training Center, Poba, Rajshahi. Mr. Bashir Ahmed, Business Director of ACI Fertilizer inaugurated the event with his opening speech. Mr. Mustafizur Rahman, Sales Manager; Mr. Yusuf Alam, Product Manager and Mr. Asadur Rahman, Product Executive gave their insightful speeches regarding the potentiality, quality and benefits of Bumper Organic Fertilizer. It was mentioned that Bumper Organic Fertilizer would increase the productivity, reduce up to 25% of the cost of chemical fertilizer and fill the gap of all important organic elements in soil. As this fertilizer is Trichoderma enriched which would reduce the possibility of soil-borne diseases in crop. Potential dealers were present at the event and



some of them gave important suggestions regarding the marketing and sales of Bumper Organic Fertilizer. Pre-booking of total 400 MT in Rajshahi region, 400 MT in Dhaka and Comilla zone also took place. Previously Bumper Organic Fertilizer was launched for Dhaka Region in September and for Rangpur Region in August this year.

Fertilizer Training for BADC Contract Farmers

ACI Fertilizer conducted training program and demonstration for contract farmers of BADC and retailers in different parts of the country during October 2016. The training programs took place at Chandpur, Comilla, Rangpur, Dinajpur, Thakurgaon, Kurigram and Chuadanga. Considering the large volume usage of fertilizers especially in the potato cultivation, the training program focused on the usefulness of Organic Fertilizer, Gypsar, Boron, Zinc, Calmag, Root Grow and Bioferti. ACI Fertilizer Field Force also worked with local seed production companies and cold storages of the areas to reach the potato cultivators in those localities.



ACI Fertilizer Q-4 Strategic Review Meeting

ACI Fertilizer arranged 3 Strategic Review Meetings with its Field Force considering the business potentials during the Rabi season in the 4th Quarter of 2016. The meetings held in Bogra, Khulna, and Dhaka on 6, 8, and 10 October respectively. The marketing, sales and promotional teams from ACI Fertilizer were present at the meetings. Mr. Bashir Ahmed, Business Director of ACI Fertilizer inaugurated the meetings with his opening speech. Mr. Mustafizur Rahman, Sales Manager gave a guideline regarding sales and credit management, while Mr. Yusuf Alam, Product Manager and Mr. Asadur Rahman, Product Executive gave directions regarding the crop wise opportunities of the products, sales and promotional program of the targeted products. Area Managers along with their Territory Officers gave their presentations on 3rd Quarter performance and 4th Quarter



planning, strategy and action plan. ZSM and RSM of respected region/zone also gave praiseworthy speech for the Filed Force. All the meetings were followed by cultural programs.

Grand Opening Ceremony of bdGardeners

The grand opening ceremony of bdGardeners took place on 1 October 2016 at their newly launched showroom in the capital. Krishibid Bashir Ahmed, Business Director, ACI Fertilizer was present in the opening ceremony as a special guest. He spoke about the program and distributed organic fertilizer rock melon plant to many gardening enthusiasts. BdGardeners is an initiative of Ajkerkrishi.com which aims to expand greenery through eco-friendly land cultivation. With the launch their own branded showroom, now anyone can get different gardening products including ACI Fertilizer products from there. Remarkably, ACI Fertilizer has come up with a wide range of organic fertilizer, macro and micronutrient, and foliar fertilizers while incorporating modern methods and technology in the soil management practices in



Bangladesh to ensure high yields of crops. The address of bdGardeners is 257-258, Grand Plaza Shopping Mall, Outer Circle Road, Dhaka.

Events and Activities

Compound Fertilizer Campaign in Kushtia Area

As a pilot program, ACI Fertilizer conducted integrated marketing activities for compound fertilizer at Chuadanga and Meherpur through roadshow, personal communication, result demonstration, and training program for farmers and retailers. Md. Farid Akhter Hossain, Area Manager; Territory Officers and Market Development Officer of ACI Fertilizer conducted the programs during the 3rd week of October 2016 and got tremendous feedback

from dealers, retailers, and farmers. They have already sold more than 50 MT of compound fertilizer after the campaign. Compound Fertilizer is a combination of essential Macro & Micronutrients. It is a package of fertilizer solution which can be used by the farmers in a right volume in proper time. ACI Fertilizer is focusing on compound fertilizer, considering the potentiality of business as well as farmer's benefit in certain areas.



ACI Motors' Customer Engagement

In October 2016, ACI Motors arranged customer and mechanics engagement meetings in Munshiganj and Jhenaidah. The meeting at Munshiganj was held on 17 October 2016 at Munshirhat, Sadar Upazilla. M/S Amir Traders, the local dealer of ACI Motors gathered about 60 participants. On 20 October 2016, another meeting was held at Kaliganj,

Jhenaidah. M/S Rafi Enterprise gathered 60 local participants in the meeting. During both of the meetings, ACI Motors officials briefed about different products, features, and benefits of using its machinery. Moreover, participants highlighted the contribution of the mechanics on agricultural development, which was followed by a feedback session.



Events and Activities

Youngsters get Glimpse of Sonalika Tractor & ACI Reaper

ACI Motors arranged a daylong "Demonstration Training program on 4 wheel Sonalika Tractor & ACI Reaper" at Dewangonj Technical School & College, Jamalpur on 5 October 2016. In that program, the students get the opportunity to gain practical knowl

edge of Tractor and Reaper operation. It is expected that such demonstrations will increase the level of interest in agri-machineries among the younger generation and eventually will increase modern agri-machineries usage in our country.



Free Sampling of Coral Fish BBQ in Fisharbour

In October 2016, ACI Agrolink Limited initiated free sampling in Fisharbour with the tagline of "Coral Macher BBQ Taste Koren Something New". The first of its kind initiative for the SBU was aimed to establish consumer confidence towards unfamiliar fish variety as well as to getting customers' orientation and feedback with some specific cooking styles for fish. Fisharbour generated a great response through the free sampling of Coral Fish BBQ.

Customers were happy as they can taste and learn to cook coral fish in an innovative manner. The recipe of the Coral BBQ was shared throughout the sampling program. Children, along others, enjoyed the cooking and sampling sessions. To be part of the initiatives in creating new safe food dimension, Fisharbour welcomes everyone to its unique forward market point and taste the real flavor of safe and healthy fish.



When to Bud? Plants' Inner 'Thermometer' Found

An international team of scientists led by the University of Cambridge has discovered the 'thermometer' molecule that enables plants to develop according to seasonal temperature changes. Researchers have revealed that molecules called phytochromes -- used by plants to detect light during the day -- actually change their function in darkness to become cellular temperature gauges that measure the heat of the night. The new findings, published on 27 October 2016 in the journal Science, show that phytochromes control genetic switches in response to temperature as well as light to dictate plant development.

At night, these molecules change states, and the pace at which they change is "directly proportional to temperature" say scientists, who compare phytochromes to mercury in a thermometer. The warmer it is, the faster the molecular change -- stimulating plant growth. Farmers and gardeners have known for hundreds of years how responsive plants are to temperature: warm winters cause many trees and flowers to bud early, something humans have long used to predict weather and harvest times for the



Photo Credit: Nik_Merkulov / Fotolia

coming year. The latest research pinpoints for the first time the molecular mechanism in plants that reacts to temperature -- often triggering the buds of spring we long to see at the end of winter. With weather and temperatures set to become ever more unpredictable due to climate change, researchers say the discovery that this light-sensing molecule moonlights as the internal thermometer in plant cells could help us breed tougher crops.

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

New Method Makes Valuable Genes Easier to Find

Scientists at the John Innes Centre in Norwich have applied an innovative technique to the analysis of wheat and barley genomes that makes it easier to pinpoint specific genes that might be used in crop improvement programmes. Identifying the gene for an interesting trait that might help you breed better crops isn't always easy -- especially if you're working with wheat or barley. But scientists at the John Innes Centre in Norwich have applied an innovative technique to the wheat and barley genomes that makes it easier to pinpoint specific genes that might be used in crop improvement programmes.

Plant breeders are on a mission to develop new and improved crop varieties that can better cope with the effects of climate change, new pests and diseases, and which can produce higher yields to feed a growing human population. To do this, it is useful to know exactly where to find the genes that are responsible for advantageous traits: disease resistance genes, for example, or genes that help plants to withstand drought. But locating the gene for a particular plant trait can be like trying to find a needle in a haystack -- it's a small, specific sequence of DNA mixed up in a jumble of other genes, regulatory sequences and non-coding DNA. For some plants, like the model plant Arabidopsis, or rice, the genomes are like small



'haybales', so the gene 'needles' are somewhat easier to find -- but for wheat and barley, two of the most important cereal crops across the globe, the genomes are so large it's like searching a whole barn full of haystacks. Working with colleagues in Switzerland and the Czech Republic, Dr BrandeWulff and his team from the John Innes Centre have succeeded in applying an innovative technique -- MutChromSeq -- to the wheat and barley genomes, which reduces the complexity of the search for a gene. It works by eliminating parts of the genome where we know the gene will definitely not be found.

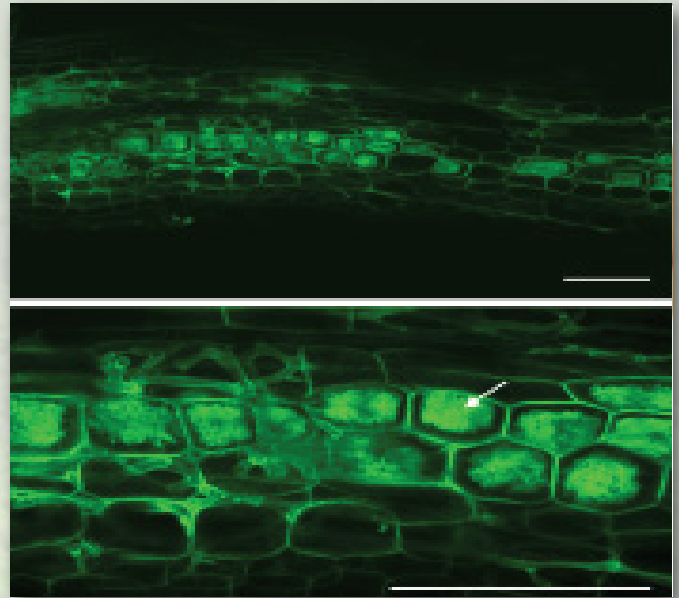
(Source: Agriculture and Food News, ScienceDaily. www.sciencedaily.com)

Researchers Identify Gene that Influences Plant Root Development

Scientists at the Molecular Phytopathology Group of Karlsruhe Institute of Technology (KIT) in Germany have identified the gene that controls plant root development and enables symbiosis with arbuscularmycorrhiza (AM) fungi. Land plants live in symbiosis with AM fungi. Both sides benefit from each other: the AM fungi help plants extract nutrients, and the plants supply the AM fungi with carbohydrates produced by photosynthesis. This is the focus of the research of the KIT group headed by Professor Natalia Requena.

The scientists identified the plant gene GRAS transcription factor MIG1 (Mycorrhiza Induced GRAS 1) that is activated specifically by AM fungi. The team studied the role of MIG1 using *Medicago truncatula*, a snail clover species. They found that MIG1 is expressed most strongly in cells containing arbuscules. It significantly modifies root cortex development by stimulating growth of more and larger root cortex cells. They observed that the overall diameter of the roots increases considerably, while downregulation of MIG1 leads to malformed arbuscules.

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



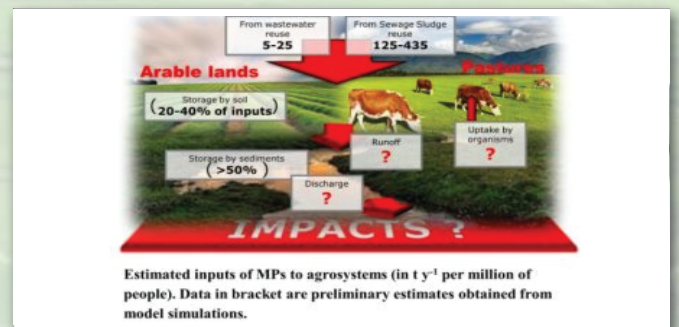
Under the microscope (confocal microscopy): The AM fungus (green) reaches the inner root cortex and forms arbuscules (s. arrow; tree-like structure, Latin arbor = tree).

Photo Credit: Carolin Heck/KIT

Microplastics in Agricultural Soils: Worrisome?

Microplastics are increasingly seen as an environmental problem of global proportions. While the focus to date has been on microplastics in the ocean and their effects on marine life, microplastics in soils have largely been overlooked. Researchers are concerned about the lack of knowledge regarding potential consequences of microplastics in agricultural landscapes from application of sewage sludge. Sewage sludge is in principle waste, but it can also represent a resource in agriculture and horticulture. Fertilizer based on sludge contains valuable nutrients, but sustainable use requires that the levels of undesirable substances in the sludge is kept under control. Waste water treatment plants receive large amounts of microplastics emitted from households, industry and surface run-off in urban areas. Most of these microplastics accumulate in the sewage sludge.

Today, sludge from municipal sewage treatment plants is applied to agricultural areas as a supplement to traditional fertilizers. These applications are generally well regulated as sludge might contain hazardous substances of different sorts. Microplastics are however not currently on the regulatory agenda for the use of sludge in agriculture. The potential consequences for sustainability and food security have not been adequately analyzed. These concerns have been expressed in an article recently published in the journal *Environmental Science & Technology*. The researchers behind the article are Luca Nizzetto and Sindre Langaas



Microplastics in agrosystems.

Photo Credit: Norwegian Institute for Water Research (NIVA)

from the Norwegian Institute for Water Research (NIVA) and Martyn Futter from the Swedish University of Agricultural Sciences (SLU) in Uppsala.

"We have found figures from the Nordic countries suggesting that a large fraction of all the microplastics generated in Western societies tend to end up in the sludge in wastewater treatment plants," says Nizzetto. Via the sludge the particles are transferred to agricultural soils. The amount of sewage sludge used as fertilizer varies greatly from country to country. In Europe and North America approximately 50 % of this sludge is reused as fertilizer on average. According to Statistics Norway, about two thirds of the sludge is reused in this manner.

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

New Options for Organic Soybean Growers

Although soybeans are one of the most widely grown crops in the U.S., few soybean farmers are using organic practices. A new University of Illinois report details organic products and practices to combat pathogens and insect pests. New growers may be motivated by a strong profit margin for organically produced soybeans. Soybeans were planted on nearly 84 million acres in the U.S. in 2016, but only a tiny fraction -- less than 1 percent -- were grown organically. This number has been increasing in recent years, and a group of University of Illinois researchers wants to give organic growers the tools they need to combat pathogens and insect pests.

"We wanted to give organic growers some opportunities. We summarized some practices to fight diseases and pests organically. It's not an easy task, but it can be done," says U of I and USDA ARS crop pathologist Glen Hartman. Hartman, along with colleagues in the Department of Crop Sciences, produced a comprehensive report summarizing the disease and pest problems faced by



soybean growers in the United States. For the first time, the report compiles specific organic management practices and products tailored for each scenario. By detailing the tools needed to successfully grow organic soybeans, the researchers hope more growers will give it a try.

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

Diversity as Natural Pesticide

Left to its own defenses, a farm field growing a variety of plants tends to attract fewer insect pests than a field growing just one type of crop. While scientists and farmers have noted that difference for years, the reasons behind it have been poorly understood. A study led by the University of California, Davis, and published 12 October 2016 in the journal Nature explains that much of it may have to do with the nutritional needs of insects. Returning plant diversity to farmland could be a key step toward sustainable pest control.

"Insects have a perfect nutrient level that they really like," said lead author William Wetzel, a doctoral student in Population Biology at UC Davis at the time of the study and currently an assistant professor at Michigan State University. "When it's too high or too low, they do poorly."

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



A western tussock moth caterpillar crawls along a plant, feasting on its leaves.

Photo Credit: Carolin Heck/KIT

Reducing Broiler Heat Stress with Light



A University of Georgia study has shown that extended lighting periods help enhance welfare and production of big broilers during high temperatures. The research involved observing the air temperature, velocity, relative humidity and deep-body temperature in broilers. Poultry extension scientist Brian Fairchild confirmed the research – that was carried out in six commercial poultry barns – revealed an interesting multifactorial process. He said, “We were looking at deep-body temperature during the hottest months of the year on the biggest birds, definitely a stressful time.” They discovered that the birds’ temperature actually increased during the night when the outdoor temperatures cooled. “This is opposite to what research shows happens in rats and humans,” he said. They found that lighting or a lack of it played a major role in this night-time increase in body temperature.

“The lights go off at dusk, the birds sit down and their litter is like a warm blanket,” Czarick said. “When sitting, a bird also decreases its surface area available for cooling by air movement.” They also observed to understand how feeding was directly affected by the time duration of the light and dark periods. They noticed that the birds went to rest soon after the lights were turned off but by extending the light period they could increase the feeding time, thus causing the birds’ core temperature to rise during the day



as well. According to Czarick, growers concentrate too much on bird temperature during the day. “The key is how much the light programme affects bird temperature during the night. It really comes down to bird behavior.”

(Source: Far Eastern Agriculture. www.fareasternagriculture.com)

Climate Change Impairs Survival Instincts of Fish



Climate change is disrupting the sensory systems of fish and can even make them swim towards predators, instead of away from them, a paper by marine biologists at the University of Exeter says. Research into the impact of rising CO₂ has shown it can disrupt the senses of fish including their smell, hearing and vision. High CO₂ levels can impair the way they behave, including making them swim towards predator smells instead of away and even ignoring the sounds that normally deter them from risky habitats.

According to a paper published in the journal *Global Change Biology* by Dr Robert Ellis and Dr Rod Wilson, climate-change marine biologists at Exeter University, these abnormal behaviours have been linked to the effect of CO₂ on how the brain processes signals from sensory organs. CO₂ levels are predicted to be 2.5 times higher in the oceans by the end of this century. The report's authors Dr Robert Ellis and Dr Rod Wilson believe that fish farms, may be the key to establishing the long-term impact of CO₂ on marine life. In their paper, *Lessons from two high CO₂ worlds: future oceans and intensive aquaculture*, Dr. Ellis and Dr. Wilson, alongside a colleague from Chile (Dr. Urbina), show that farmed fish



Carbon dioxide levels are predicted to be 2.5 times higher in the oceans by the end of this century.

Photo Credit: Dudarev Mikhail / Fotolia

often live in CO₂ conditions 10 times higher than their wild cousins.

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



Believe it or not!



- Eggs contain the highest quality protein you can buy.
- Egg yolks are one of the few foods that are a naturally good source of Vitamin D.
- Yolk color depends on the diet of the hen.
- Eggs age more in one day at room temperature than in one week in the refrigerator.
- An average hen lays 300 to 325 eggs a year.



Nutrition Chart

Nutrient Contents	Egg (Boiled, 1 large or 50 g)	Nutrient Contents	Egg (Boiled, 1 large or 50 g)
Energy	78 kcal	Phosphorus	86 mg
Carbohydrates	0.6 g	Potassium	63 mg
Fat	5.30 g	Sodium	62 mg
Protein	6.29 g	Calcium	25 mg
Sugars	0.56 g	Water	37.31 g

Source: USDA

Tips

If you want to test the freshness of an egg, you can try any of these steps:

- Place the egg in question in a bowl or wide glass of cold water and see if it floats. If the egg is floating, it is not a fresh egg. However, this does not necessarily mean it's bad or unsafe to eat.
- Hold the egg up to your ear and shake it, listening for a sloshing sound. A fresh egg should not make much, if any, sound when you shake it. Again, a sloshing egg only indicates that the egg is old and does not mean the egg is unsafe for consumption.
- Crack the egg open on a plate or in a large bowl and check the quality of the yolk and white. The integrity of the egg will lessen as it ages, so it won't hold together as well as a fresh egg.

Sharing is caring!

Eggshells are fragile. As we have eggs in our everyday meal, we also have eggshells which can be repurposed with the help of little artistic touch. Eggshells can be reused for some outstanding crafts. You can make the eggs part of your home decor with some outstandingly crafted eggshell show pieces as seen in the following pictures. The most amazing fact about it is that you can do it yourself!



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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.