

“Lahore Science Mela” 2018 interaction of science and culture

Hina Baloch

A **TWO-day** long activity “Lahore Science Mela” was organized by Khwarizmi Science Society (KSS) at Ali Institute of Education with the support of prominent Philanthropist Syed Babar Ali. Fifty plus stalls, book fairs, displays were set up for the children. This event was a provisional science museum which welcomed the people of Lahore to explore the scientific discoveries and milestones in Pakistan.

A large number of organizations along with educational institutes became the part of the event including Technology Times, Pakistan Science Foundation (PSF), ECO Science Foundation (ECOSF), Pakistan Council for Scientific and Industrial Research, Lahore University of Management Sciences, GC University, CESOS University Peshawar, Institute of Business Administration, Community College Shukkur, University of Engineering and Technology, Pakistan Science Club, Robokids, EjadTech, Lahore Astronomical Society, and many more.

Technology Times in collaboration with PSF and Pakistan Academy of Sciences introduced a unique feature in Science Mela by displaying a 100 feet long banner having pictures of eminent Pakistani scientists and engineers who were decorated by Government of Pakistan for their achievement in their respective fields. It

is a great opportunity for children as well as all other participants to know about real legends of Pakistan. A large number of students and citizens appreciated the Banner, and click photos with their favorite personalities pictures.

“The Lahore Science Mela (LSM) 2018 is a science fest; showcased inventions, discoveries, experiments, science models and artifacts received from all parts of Pakistan. It is an opportunity to engage all citizens, especially the children in celebrating science. Our focus is on the wonder aspects of practical science accomplished through practical activities such as hands-on games and experiments that will appeal to our young boys and girls”, said by Dr. Saadat Anwar Siddiqi the President KSS.

There is a session on interaction among scientists, educators, doctors, engineers and public in the Lahore, the cultural hub of Pakistan. This year, ECOSF brought two Mathematics experts from Isfahan Iran to display interactive maths games and puzzles that children enjoyed and learned principles of Mathematics with fun.

Dr. Manzoor Hussain Soomro, President ECOSF told that “team from Iran not only inspired young scientists, but also instructed science students about theoretical and practical aspects of mathematics. As mathematics is considered to be a dry subject but it is one of the most important science and if it taught interestingly many



children can be attracted to it”.

Dr Sabieh Anwar, brain behind the LSM said, “the science museum here at LSM showing lively exhibits of science, art and culture. The festivals demonstrate to aware students that science is not just a dry facts subject”.

The science fair provided opportunity for students of smaller town to exhibit their scientific ideas. They excellently and confidently displayed their science projects and inventions, and also instruct others about the importance of evaluating the scientific phenomena.

Participated school’s children have made number of interesting projects like WiFi enabled “Fruit Cart” to pick and load the fruits

and vegetables in gardens and farms, solar panel which could be used to automate for watering the fields.

Dr Sharareh Dastjerdi, from Isfahan Iran, who also set up stall of Khana-e-Riazi Isfahan (Isfahan Mathematics House), told that coming to Lahore was a tremendous experience and this science fair provided opportunity to interact with upcoming scientists of Pakistan.

Commenting on the Banner, the President KSS, Dr Saadat Anwar Siddiqi said, “our people especially young generation is not familiar with the real heroes of Pakistan – the scientists, the engineers, who dedicated their lives for Pakistan. This Banner introduced our

scientists and engineers briefly. Through this people will know about their contribution which will encourage them to follow. Moreover, this Banner also introduced different fields of science and technology to our young scientists, this will help them to choose their area of study in future”.

The purpose behind arranging Mela is not to teach but to have fun, through hands-on activities, workshops, fascinating science experiments and demonstration of technological tools that are aimed at all age groups, thus fueling visitors’ innate curiosity towards science. KSS is aimed at promoting the science culture in Pakistan’s educational institutions and in general public. ♦

Pakistan spark at Davos annual meeting of WEF 2018

INFORMATION TECHNOLOGY and Telecom Minister Anusha Rahman Khan participated in Davos to partake in the annual meeting of World Economic Forum (WEF) 2018 in Switzerland.

She had participated as a special guest to speak on the sessions, including connected corridors, protecting the digital civic space, privacy and security, protecting the digital space, leveraging digital to deliver value to society, along with renowned speakers from across the world. She highlights the successes of Pakistan in the field of ICT and future for continued growth in this sector to enable transformation into “Digital Pakistan”.

The secretary-general of the International Telecommunication Union (ITU), a specialized agency of the UN for telecommunica-



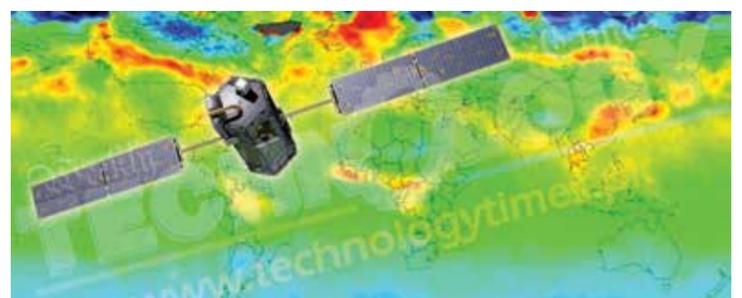
tions, has also requested her for a special session of broadband commission for sustainable development, during the annual session of the WEF.

Broadband Commission for Sustainable Development is a joint initiative of ITU and UNESCO aimed at boosting ICT/broadband connectivity and digital development initiatives. Anusha is a “commissioner” on the Broadband Commission since 2016. ♦

Pakistan invent latest satellite-based technique of CO² mapping

MINISTRY OF Climate Change started a project in Pakistan Environmental Protection Agency titled as “Geomatic Center for Climate Change and Sustainable Development”. The project with latest techniques and evaluation methods encourages the application of Satellite Remote Sensing (SRS), Geographical Information System (GIS) and Geographical Positioning System (GPS) technologies in environmental monitoring and decision-making. Geomatic Centre has already initiated the process of mapping CO₂ emissions in Pakistan using GIS.

Officials of EPA, SUPARCO and Ministry gathered at a seminar on “Role of Geographical Information System (GIS) in Monitoring CO₂ Emissions” and briefed the students, media persons and



environmentalists about the new project and its utility. The seminar focused on capacity building and mixing skills of different public and private stakeholders on (GIS) and Remote Sensing (RS) technologies.

CO₂ is one of the greatest donors to the global warming which ultimately impacts the climate change. A GIS is a logical choice for a system to house the CO₂ source and sink data, as it could visually display spatial re-

relationships and do queries and screening analyses easily.

The Geomatic Center with its enormous efforts and technical proficiency prepared the Environmental Atlas of Islamabad which was inaugurated by the Honorable Parliamentary Secretary for Climate Change, who appreciated the efforts of the Geomatic Center for organizing this seminar and thanked the participating organizations for making it successful. ♦

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Agriculture, climate change, and food security



Climate change is having significant results on our planet's diversity of life and individuals lives. Sea levels are rising and they are warming. Longer, more exceptional dry seasons debilitate freshwater supplies and yields, jeopardizing endeavors to nourish a developing world populace. Without deliberate actions, the changing atmosphere will genuinely compromise food production globally and in Pakistan's food security. It will influence food availability by lessening the efficiency of products, livestock and fisheries, and prevent access to food by disturbing the livelihoods of a large number of rustic individuals who rely upon agriculture for their income. Pakistan is an agriculture-dependent country, with more than 47 percent of its populace procuring their work from agribusiness. The agriculture contributes 24 percent to GDP. Effects of global climate change in Pakistan are obvious in the form of growing regularity of droughts and flooding, increasingly erratic weather behavior, changes in agricultural patterns, lessening in freshwater supply and the loss of biodiversity. In a nutshell, climate change could hamper our targets, as well as of many of the Sustainable Development Goals (SDGs). The Indus Valley, which remains the strength of Pakistan's cultivation, weakened by the fancies of environmental change, induced through anthropogenic intercessions which results global warming. There will be a rise in temperature by 3 degrees by 2040 and up to 5-6 degrees by the end of the century. Natural uncertainties like changing in precipitation pattern, extremely high and low temperatures, cyclones, thunderstorms, variation in water level, impurification of air, water and soil, have made agriculture and agri-production a challenging issue. Uncommon heavy rain falls in 2010, which resulted in floods and distortion of agriculture and property, are an example of this continuously changing phenomenon. The loss to the economy and the people sufferings are still remembered and unforgettable. Inclination towards agriculture is not the same as it was decade ago. Climate change has hostile impacts on agriculture but the fact is that farming community is not even aware of it. They don't even know that because of rising temperature cropping pattern may face drastic changes in the coming 2-3 decades. There will be less water availability, which alters the crop rotation and cropping patterns. Our farmers are still practicing old methods of farming. There is a need to address the agricultural challenges arising because of climate change in Pakistan. It is the need of the time to carefully observe climate change, its causes of extreme weather actions and find the best possible solutions to the problem. A modification is desired to more sustainable food systems. A framework that deliver more, with more socio-economic advantages and with less environmental effects. It is established that a reformative, dynamic farming sector can give ecological advantages and facilities while making agri-business and supporting livelihoods. Timely preparation and adaption to climate change is essential not only to tap positive opportunities but also to minimize the adverse impacts of climate change in all sectors of economy including agriculture, livestock, forest and water resources particularly. At the same time there is need of efforts to introduce measures including structural and non-structural and bio-engineering measures to protect natural resources from climatic hazards that are expected to increase due to climate change and may well overtake the positive impacts of these climate changes. In the wake of cumulative climate change risks supplemented by growing population pressure on the already inadequate natural resources, the present agriculture climate policies are absolutely inappropriate and should be altered accordingly for better food security.



Asghar Abbas

Use botanical driven essential oils against ectoparasites of veterinary importance

The control of ectoparasites of veterinary importance using synthetic neurotoxic insecticides has been gradually challenged by the progress of insecticide resistance contrary to lice, mites and ticks. Two or three terpene.....

Use botanical driven essential oils against ectoparasites of veterinary importance

Asghar Abbas¹, Rao Zahid Abbas, Muhammad Usman, Muhammad Rizwan and Safdar Imran

The control of ectoparasites of veterinary importance using synthetic neurotoxic insecticides has been gradually challenged by the progress of insecticide resistance contrary to lice, mites and ticks. Two or three terpene or terpenoid components are the main parts of the essential oils, which create up to 29.99% of the oil. The insecticidal or acaricidal effectiveness of various essential oils has been well known in a diversity of pests. This efficiency is frequently described to the oil's main constituent however, there is as wellproof that the numerous oil mechanisms may effort in cooperation. This may happen because some oil mechanisms support cellular addition and immersion of other lethal constituents. Although, the method of action of many essential oils or their components is largely unknown, but there is confirmation of a harmful result on the insects nervous system. For example, Availability of terpinen-4-ol, a monoterpene is high in concentrations in tea tree oil, stops arthropod enzyme i.e. acetylcholinesterase which is important for communication of accomplishment potentials. Alternatively, Oils are hydrophobic in nature so, they may instantaneously apply mechanical special effects on the parasite as water stress which is responsible for the death of parasites by the mechanism of distressing the cuticular waxes and blocking the spiracles or suffocation. A great deal of the According to recent research about the efficacy of essential oils efficacy as means for the controller of arthropod ectoparasites of veterinary importance has been approved out using such broadly different withdrawal method, formulations, application procedure and methodologies to harmfulness measurement that it may



be tough to repeat or express studies.

Against Flies

In a study, three oils (i.e. *Corymbadioscoridis* L., *Artemisia herba-alba* Asso and *Calendula officinalis* L.) have been shown high repulsive activity in vitro against flies. Studies have proposed that essential oils may offer in effect of inhibition and controller of the myiasis-causing fly *Lucilia cuprina* (Weidemann) (Diptera: Calliphoridae) and then ecrophagous *Synthesio myianudiseta* (Diptera: Muscidae). Broad in vitro study establish essential oil of tea tree have been shown major repulsive properties in contrast to mature and larvae, also having larvae killing and ovicidal response in contrast to *L. cuprina*. There has been wide investigation in the last ten years into the repulsive and acaricidal response of various essential oils against ticks infecting animals and can help to control them.

Against Ticks

There has been extensive research in the last decade into the repellent and acaricidal effects of many essential oils against ticks. The majority of these studies have focused on species of *Rhipicephalus* and *Ixodes* (both: Ixodida: Ixodidae) ticks, largely in vitro. However, data on the effects of essential oils as tick treatments or repellents in vivo are very limited. One of the few studies in the latter category used a soap containing 0.03 L/g of essential oil of *Ageratum houstonianum* against ticks biting goats.

Against Mites

Early in vitro studies found that lavender essential oil and many of its constituents were effective against *Psoroptes cuniculi* (Hering) (Sarcoptiformes: Psoroptidae). These studies used contact and vapour exposure assays to show that there was a structural basis to the acaricidal properties of essential oil derivatives.



Ammar Ahmad

Extinction of vultures due to diclofenac sodium residues

Gyps bengalensis (Oriental white-backed vulture), *Gyps indicus* (Long-billed vultures) and *Gyps tenuirostris* (Slender-billed vultures) are three species of vultures present in South Asia. Oriental white-backed vulture.....



Extinction of vultures due to diclofenac sodium residues

Ammar Ahmad¹, Yasra Sayyed² and Amna Mahmood³

Gyps bengalensis (Oriental white-backed vulture), *Gyps indicus* (Long-billed vultures) and *Gyps tenuirostris* (Slender-billed vultures) are three species of vultures present in South Asia. Oriental white-backed vulture (OWBV) specie was one of the most common raptors in subcontinent including Pakistan but now in grave danger of extinction due to decline of more than 95% in population size since early 1990's. The Peregrine Fund started its Asian Vulture Crises Project in collaboration with the Ornithological Society of Pakistan, in 2000, and selected 16 colonies of OWBV having 2400 active nests, as study sites in Layyah, Muzafargarh, Kasur and Khanewal districts of Pakistan to measure mortality. During the period of 2000-2003 there was high adult and sub adult mortality (5-86%) and population decline (34-95%) associated with visceral gout and renal failure. Then evidences were presented that showed the direct relationship between the residues of Diclofenac Sodium (Anti-inflammatory drug) and renal failure in vultures. These evidences were supported by the experimental reproduction of renal failure due to residues of Diclofenac Sodium given through direct oral route and through feeding in live experimental population of OWBV, hence it was purposed that residues of Veterinary Diclofenac Sodium in the dead carcass of animals are the real cause of severe decline in OWBV population in Pakistan.

During that period of study, gross post-mortem was performed on total of 259 adult and sub adult Oriental white-backed vultures, from which 219 birds (85%) had clear post-mortem lesions of visceral gout, such as urate deposits on the surface of internal organs. Renal failure is the most common cause of visceral gout in birds, because renal failure leads to hyperuricaemia and deposition of uric acid within and on the surface of the internal organs of the bod. Renal failure can be caused by metabolic, degenerative, toxic or infectious disease. During that study, detailed diagnostic testing and necropsies were performed to verify

the renal failure and reveal the cause behind it, on the subset of 42 OWBV (28 with visceral gout and 14 without visceral gout), within the 24h of their death. The remaining were decomposed as much that they were unsuitable for diagnostic testing, but upon gross post-mortem there were clear lesions that allowed the presence or absence of visceral gout to be determined. After the completion of diagnosis it was revealed that from the sub-subgroup of 14 birds that were without visceral gout, 8 were died of trauma, lead poisoning, intestinal foreign bodies and organophosphate poisoning. Among the other sub-subgroup of 28 birds with visceral gout, 27 birds were having clear significant lesions of severe renal tubular necrosis and crystals of uric acid in body tissues and kidneys, there were no fibrosis, no inflammatory lesion of infectious disease. Out of 28 only one bird had clear identifiable infection of *Mycobacterium avium*. Additional tests were performed in the vultures with visceral gout to eliminate the other possible diagnosis, like toxicity of Mercury, Arsenic, Cadmium and Lead as well as infections with West-Nile, Infectious Bronchitis and Avian Influenza Viruses; in result all the tests were negative for toxicities and deficiencies of metals and infections with viruses.

Vultures are the carnivorous birds and the main source of food for vultures is the dead livestock. Therefore it was hypothesized during the study that, there might be any pharmaceutical drug responsible for the renal failure in these raptor birds. A survey was conducted in that region in which Veterinarians and Veterinary Pharmaceutical retailers were accessed to identify the drugs that were known to be absorbed orally and toxic for the renal system of birds. As a result of survey, only one drug met that criterion was Diclofenac Sodium, NSAID drug used as anti-inflammatory, analgesic and antipyretic drug in domestic livestock. Then mass spectroscopy and liquid chromatography of kidneys of vultures was conducted to detect the residues of Diclofenac Sodium in kidneys. The detected concentration of drug residue in the kidneys of those died of renal toxicity was 0.051-0.643 μ g/g



and not detected in those died from other causes.

For the verification of renal toxicity due to Diclofenac in OWBVs, four captive, non-releasable juvenile OWBVs were considered as experimental birds and out of these four, two were administered with high single oral doses (2.5mg/kg) of Veterinary Diclofenac and other two were administered with low single oral doses (0.25mg/kg) of Veterinary Diclofenac. Within 36-58h of the administration of Diclofenac, both the birds' recipient of high dose and one of the low dose recipient died as a result of acute renal failure and visceral gout showing the same microscopic lesions as the field cases. Diclofenac residue concentration was 0.29, 1.1 and 0.16 μ g/g in the kidneys of two high dose-vultures and one low dose-vulture respectively.

Another experiment was performed to verify that carcass of Diclofenac treated livestock contain sufficient concentration of drug to cause renal failure and ultimately death in vultures. For this purpose, a buffalo was administered with 2.5mg/kg Intramuscular Veterinary Diclofenac once daily for 3 days and then slaughtered after the admin-

istration of last injection and 10 OWBVs fed meat from that buffalo containing 5.7, 1.5 and 0.7 μ g/g Diclofenac residues in kidney, liver and muscle respectively. Ten more OWBVs were fed on buffalo meat containing 6.4 μ g/g Diclofenac residues. On the basis of amount of food consumed and concentration of residues in meat, eight OWBVs ingested 0.005-0.3 mg/kg Diclofenac, two of these vultures died of renal failure. Other six remained clinically normal upto 6 months. Two vultures ingested 0.5-0.6 mg/kg Diclofenac and one of them died after 1 day of exposure due to renal failure and other remained clinically normal. Ten OWBVs ingested the dose of 0.8-1.0 mg/kg and all those ten vultures died of renal failure. All those OWBVs died due to renal failure after ingesting Diclofenac containing meat were having same post mortem renal lesions as of those birds which were directly administered with Diclofenac or the field cases.

Moreover to verify that renal toxicity or visceral gout was not associated with captivity, all the experimental vultures were held in captivity upto 75 days before the start of experiment and exposure to the Diclofenac Sodium,

and all vultures remained clinically normal in that period, so it was clear indication that visceral gout or renal failure was not associated with captivity. Mortality of 65% exposed vultures showed that there is a significant relationship between renal failure and Diclofenac sodium. Water contaminated with Diclofenac may be a source of renal failure but it was already proved that "renal failure caused by Diclofenac is highly dose dependent", and the concentration of this NSAID in water was very low, unlikely to cause toxicity.

Pharmaceutical drugs of Veterinary field can exert potentially toxic effects on the ecosystem. The decline in the population of vultures due to Diclofenac and its identification may serve as a landmark and provides an opportunity for conservation of wildlife and ecosystem. Another example of ecosystem damage by veterinary pharmaceuticals is the shedding of anthelmintic drugs in the faeces of livestock that could be toxic and could cause extinction of important invertebrate species.

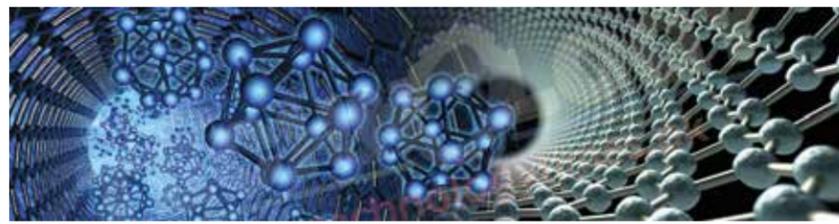
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Sittara Naz

Nanotechnology: A multifaceted technology

The term 'Nanotechnology' was described by Taniguchi first time in 1974 and explained it as "Nanotechnology is the science which deals the synthesis and application of Nano-size particles". The nanoparticle size ranges



Nanotechnology: A multifaceted technology

Sittara Naz & Dr. Muhammad Amjad Ali

The term 'Nanotechnology' was described by Taniguchi first time in 1974 and explained it as "Nanotechnology is the science which deals the synthesis and application of Nano-size particles". The nanoparticle size ranges from 1 to 100 nm. The production of engineered nano-materials is a scientific breakthrough in material design and nanoscience has developed significantly during the last decade as it has transitioned from worktable to various applied fields like agricultural and environmental sustainability, food industries, medicine and cosmetics. For instance, silver nanoparticles alone are used as antimicrobial agents and useful in medical devices, cosmetics, electronics and household appliances.

Nanotechnology has emerged as a vital tool to explore several avenues of science and technology research and promises a pool of opportunities in areas of agriculture, medicine and healthcare, biotechnology, materials and manufacturing, energy, information technology in conjunction with the national security. Nanotechnology is projected to become a \$1 trillion market in near future and employ about 2 million workers and more than 475 nanotechnology products.

Nano-materials exhibit special physical and chemical properties that make them interesting for novel, environmentally friendly products. Due to the significant contribution of nano-technological products, processes and applications in environmental and climate protection, we save raw materials, energy, water and reduced greenhouse gases and hazardous wastes. Nanotechnologies are proving as more helpful in improvement and revolutionize many technologies in agriculture sector, food safety, medicine, transportation, energy, environmental science and among many others.

Applications in Agriculture: There is no second opinion that agriculture is a backbone of most developing countries and around 60% population of those countries relies on it for their livelihood. Currently, the most imperative challenges faced by global agriculture include changing cli-

mate, urbanization, sustainable use of natural resources, environmental issues like accumulation of pesticides and fertilizers, and increasing resistance of fungal pathogens to fungicides. Similarly, agriculture scientists and farmer face many challenges like low nutrient use efficiency, biotic and abiotic stress problems and water availability. Nanotechnology addresses many solutions for these problems due to having unique characteristics. Nanotechnology constructs various nanostructures that contain unique mechanical, chemical and physical properties. Some examples are recently synthesized electrochemically active carbon nano-tubes (CNTs), nano-fibers and fullerenes that are used as highly sensitive bio-chemical sensors. These Nano-sensors are used for sustainable agriculture, particular for soil analysis, pesticide and nutrient delivery, water management and delivery, easy bio-chemical sensing and control. The involvement of nanotechnology in farming systems has optimistic visions for improvement of nutrient efficiency through the use of Nano-formulations of fertilizers, development of new-generation pesticides and their carriers, surveillance and control of pests and diseases, contravention yield barriers through bio-nanotechnology, understanding mechanisms of host-parasite interactions at the molecular level, strengthening of natural fibers, removal of contaminants from soil and water, improving the shelf-life of vegetables and flowers etc. From sowing to harvest, a major problem is stress (drought or saline) on crops. Silver and silicon (Nano-SiO₂) nanoparticles improve seed germination, growth and development of different plant species under saline conditions which show significant effects on crop production in agricultural sector. Nanotechnology also has a keystone role in the plant disease management. Various nanoparticles have antifungal and antibacterial activities which improve plant resistance against many fungal and bacterial diseases as compare to macro-particles. Copper nanoparticles showed significant antifungal activity against *F. oxysporum*, *F. culmorum* and *F. equiseti* which are considered most notorious



fungal pathogens of crops worldwide. Many carbon-based nano-material's such as nanotubes, fullerenes and graphene oxide show antifungal activity against two plant pathogenic fungi *Fusarium graminearum* and *Fusarium poae*. Moreover, nano-particles i.e. gold and tungsten nano-particles are largely used in genetic engineering of the plants through gene gun technique for transformation of gene of interest into the plant genomes.

Applications in Food Technology: Nanotechnology plays a keystone role having on several aspects of food science and technology, from 'how food is grown' to 'how it is packaged' and the processes in between. Many companies are using Nano-materials that will make modification in the taste, safety and health benefits of food. Zinc oxide nanoparticles can be integrated into plastic packaging to block UV rays, provide anti-bacterial protection and also improving the strength and stability of the plastic film employed for food packaging and preservation. Researchers are using silicate nanoparticles to provide a barrier to gasses and moisture in a plastic film used for packaging. This could reduce the possibly of food spoiling or drying out. Storage bins are being produced with silver nanoparticles embedded in the plastic. The silver nanoparticles kill bacteria from any material that was previously stored in the bins, minimizing health risks from harmful bacteria and increasing the storage time of various food items. Nanosensors are being developed that can detect bacteria and other contaminants i.e. *Salmonella*, at a packaging plant.

Application in Medicine field: The use of nanotechnology in the field of medicine could revolutionize the way we detect human diseases and treat the damage to the human body in the future. First and most important application of nanotechnology in the medicine field is the employment of nanoparticles for delivering drug, light, heat, and/or other substances to specific types of cells. Nanoparticles can help to deliver medication directly to cancer cell and minimize the damage to the healthy tissue. It dramatically reduces the toxic effect of chemotherapy as well. For the detection of targeted sequences of nucleic acid, the gold nanoparticles are approved as probes. Gold nanoparticles are also investigated for their role in the treatment of cancer and other diseases. Nano-medicine can improve the vaccination methodology such as delivery of vaccines without needle use. Novel gene sequencing technologies are also introduced by nanotechnology that enable the detection of single molecule with minimum sample preparation and instrumentation that work at low cost and high speed. This will enable the scientists to detect genetic mutations involved in genetic diseases and modification of genetic material through gene therapy.

Application in Cosmetics and Skin Care: Sunscreens that contain zinc oxide nanoparticles block the ultraviolet rays and minimizing their effects on the white coating of the skin. Similarly, Ethosomes are lotions that use nanoparticles to deliver nutrients that promote hair growth. Different companies like Antaria, Elsom Research, Sinere

and Marie Louis Cosmetics use various nanoparticles in their products such as sunscreen, anti-aging cream and growth products. In some skincare lotions, the nutrients are encapsulated in nanoparticles, making up nanoemulsions. As compare to conventional emulsions, nanoemulsion due to small size of nanoparticles, allows the nanoparticles to penetrate deeper into the skin, delivering the nutrients to more layers of skin cells.

It is concluded that the relevant information regarding nano-products has revealed that nanotechnology has potential prospects of use and application in the detection, diagnosis and management of plant diseases. Nanomaterials, nanotubes and nanocapsules can efficiently carry higher concentration of active ingredients of pesticides, host resistance including chemicals, polyamine synthesis inhibitors. Enzyme based biosensors coated with nanoparticles of Au, Ag, Co, Ti, etc may help in diagnosis of plant infection. Minimizing the adverse effects of pesticides on human health and environment is an important aspect taken care by nanotechnology. Similarly, nanotechnologies have a vast application in environmental protection, food related industries like storage, preservation and packaging of food, in medical sciences to deliver medication directly to cancer cell and minimize the damage of healthy tissue and in cosmetics. However, there is an urgent need for a systematic evaluation of the potential effect of nanotechnology. Therefore, it is recommended that the eco-toxicological effect of nanomaterial be clarified before their application.



Iqra Ghafoor

Soil fertility release management

The loss of soil fertility is an important problem in large areas that have been utilized for agricultural production. Enhanced concentration, intensification and specialization of crop and livestock production without sufficient consideration of the natural site-specific soil and climate conditions caused pronounced degradation and partly



Jawad Hassan

Custard Apple: Intro and importance

Custard apple fruit is an eatable, tropical, naturally sweet in taste. Its botanical name is *Annona reticulata* L. in family Annonaceae. It is known with different names in different countries, also termed as “sweetsop” or as “sugar apple”. In some English areas it is also known as “Bull’s heart” due to its structural appearance. Indians know

Soil fertility release management

Iqra Ghafoor

The loss of soil fertility is an important problem in large areas that have been utilized for agricultural production. Enhanced concentration, intensification and specialization of crop and livestock production without sufficient consideration of the natural site-specific soil and climate conditions caused pronounced degradation and partly irreversible damage of the soil including such processes as soil compaction, water and wind erosion, water logging, chemical degradation and humus loss.

Water pollution has become a growing concern over the last century as more and more waste is being disposed of in our oceans, rivers and lakes. This increase in pollution is harming our food supplies, drinking water and environment. Make the soil unhealthy and soil structure damage or over excess any chemical element both macro element and micro elements nutrients for crops.

Soil quality is determined by a number of factors, all of which affect fertility. A good soil will sustain the growth of the required crops to a high standard, without the need for excessive nutrient enhancements or artificial fertilizer.

We need to understand what

has underpinned urbanization in the past and how this is changing and might change in the future to be able to consider its implications for agriculture and food production. Urbanization brings major changes in demand for agricultural products both from increases in urban populations and from changes in their diets and demands. This has brought and continues to bring major changes in how demands are met and in the farmers, companies, corporations, and local and national economies who benefit (and who lose out). It can also bring major challenges for urban and rural food security.

Water way is changing because of more building, it makes some areas no water but some become flooded. Flooding in urban areas can be caused by flash floods, or coastal floods, or river floods, but there is also a specific flood type that is called urban flooding.

Urban flooding is specific in the fact that the cause is a lack of drainage in an urban area. As there is little open soil that can be used for water storage nearly all the precipitation needs to be transport to surface water or the sewage system. High intensity rainfall can cause flooding when the city sewage system and draining canals do not have the necessary capacity to drain away the amounts of rain that are

falling. Water may even enter the sewage system in one place and then get deposited somewhere else in the city on the streets.

The success of farming business depends in large part on the quality of soil. This is why soil improvement is such an important concern for farmers. Not all soil types are suitable for farming. We are lucky to have access to some of the best crop growing soils in the world.

Therefore the soil fertility release management is very important for long sustainable agriculture and green environment. Farmer can get benefit a lot because of the healthy soil. The crop can produce more high yield and better quality and make the life around the world better.

Application of organic manures for maintenance of soil at high fertility level is essential. Organic manures improve physical, chemical as well as biological properties of soil. Organic matter (pool of nutrients) in the soil will play important role in soil like increasing water holding capacity of soil, increasing CEC soil and this will prevent leaching of nutrient through soil profile as well as increasing soil microorganisms. Organisms occur wherever organic matter occurs. For example, because of farmers do not apply enough organic matter in the soil, the nutrients that could be up taken by plants are leached



through soil profile and plant suffer from lacking nutrients especially nitrogenous and phosphorous, hence low agriculture output arises. Organic manures @ 20 to 25 ton/ha can be applied in different forms like farm yard manure/ compost/ dung manure. Press mud can also be used as an organic manure @ 5 ton/ha particularly useful in saline alkali soils. Sugarcane trash can be used as a mulch and sprayed with 80 kg urea, 100 kg Single Super Phosphate and 10 kg decomposing culture/ha for better decomposition. Sugarcane trash can also be incorporated while making organic manure along with press mud and use of

earthworms for preparing vermicomposting.

Besides social community will be able to get potable water for using in their daily life. Also, courtesy of having fertile soil, agriculture production will increase more and country economy will rise due to more agro-processing industries for value chain management as well as. Agriculture helps urban area to deal with waste. This will create more jobs for people and the lives of all populations will completely be improved.

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Custard Apple: Intro and importance

Jawad Hassan¹, Dr. Rashad Mukhtar Balal¹, M. Ali Khakwani²

Custard apple fruit is an eatable, tropical, naturally sweet in taste. Its botanical name is *Annona reticulata* L. in family Annonaceae. It is known with different names in different countries, also termed as “sweetsop” or as “sugar apple”. In some English areas it is also known as “Bull’s heart” due to its structural appearance. Indians know this fruit as “ram phall”. In Pakistan this minor fruit is also known with a unique name “Sharifa Fruit”.

It is native to West Indies, but in the early times it was carried from Central America to Southern Mexico. The most favorable environmental condition for this

fruit is in the East coast Malaya. In India, trees are cultivated around the Kolkata. For the cultivation of this fruit plant require 25°C to 28°C with minimum elevation of 800 m (2600 ft) from sea level under ample humidity for its better growth and fruit development. The suitable cultural media for the plant growth is politic limestone and it does best in production.

Custard apple tree is not too much alluring because it has spreading type crown and shrub like plant with height of 15 to 35 ft., the fruit of this plant is known as “Ugly Duckling”. Custard apple fruits have different shapes like oval shape, symmetrical heart shaped, lopsided or irregular and can be weight up to 450

g. But the most alluring thing in this fruit and fruit plant is stunning favors for human body. Leaves, fruit and seed of fruit is valuable for different industries and human body.

The conventional process of propagation is through seed, but it can also be propagated by inarching, budding and grafting. There are not common cultivars of this fruit, but it can be classified according to their yellowish and brownish skin colors. The tree is fast growing in nature so, responded positive to the cultural practices i.e. mulching, organic fertilizers, frequent irrigation etc. The fruiting of plant starts after two years, plant hold fruit two to three months for ripening process. The insect which com-



monly attack on fruit is chalcid fly and the common disease which is observed is dry charcoal rot, this disease is fungal therefore during the storage of fruit, it is treated with antifungal powders i.e. Bavistin. The average shelf

life of fruit is about 5 days but can be extended up to 9 days by treating it with some chemicals. Production average of this fruit plant is 34-45 kg per year.

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G. Muhae-Ud-Din

Review on leaf rust of wheat and their management through biocontrol agent

Rust are the most deleterious fungal disease of the cereals especially of wheat crops worldwide. This is due to their wide range of distribution, high capability of mutation to form new races that are capable to



Review on leaf rust of wheat and their management through biocontrol agent

Ghulam Muhae-Ud-Din, Muhammad Amjad Ali, Usman Arshad, Amjad Abbas, Abdul Jabbar and Muhammad Jabran

Rust are the most deleterious fungal disease of the cereals especially of wheat crops worldwide. This is due to their wide range of distribution, high capability of mutation to form new races that are capable to attacking the previously resistant varieties, have the capability to move long distance with the wind and air and have the potential to complete more rapidly their life cycle under the optimal conditions. Wheat rust fungi are obligate parasites, required living organism for the completion of their life cycle because they cannot be grown on the artificial media. The life cycle of the rust disease of the wheat is very complicated, required one alternate host organism or their life cycle and diverse types of the spores are need for the completion of their life cycle under the suitable condition. Leaf rust, stripe rust and stem rust of wheat are the three most deleterious disease of the wheat. In Pakistan, leaf rust of wheat is the most common diseases as compared to other two rust diseases of the wheat. Although stripe rust of wheat is also treacherous diseases but less dangerous as compared to the leaf rust of wheat. The prevalence of stem rust of wheat is in traces due to unsuitable environmental conditions. But a new race of the stem rust of wheat is detected known as Ug99 in East Africa which overcome the resistant source in the wheat cultivars worldwide. Until seven new races of the Ug99 are known and it also spread to the various countries of the world and affect the quality and quantity of the wheat. Leaf rust disease cause more damage when upper leaves of the wheat are severely attacked by the rust spores before the flowering stage. Rust reduce the size of the infected leaves, which reduce the period of grain filling as a results size of kernel remain as small. Leaf rust of wheat produce orange-brown like urediospores on the upper surface of the infected leaves and under the most suitable condition, urediospores can cover the entire upper surface of the leaves in the susceptible cultivars. Many urediospores are formed in the

single uredia. With the passage of time as the wheat plants goes to the maturity stage, Uredinial stage of leaf rust convert into another stage known as telial stage, (telial stage is similar with the uredinial stage in size) but they are black in color and develop on the lower surface of the leaves. Telia produce the spores known as teliospores which are brown-black in the color. Teliospores are not always produced particularly if the wheat infection occurs late in the growing season.

Occurrence of leaf rust of wheat

The prevalence of wheat rust diseases in cultivated areas of the world have significantly affect the human culture and their civilization. It was mentioned in the Israel's excavations that urediospores of the wheat rust have been discussed in the 1300 B.C. It was thought that patriarch Jacob family face the problem of rust epidemic in 1870 B.C., and suggested that rust affect the Roman and Greek in about 500 B.C, they all peoples thought that their rust God is angry from their behaviors, so they face the problem of crop failure.

First report of leaf rust of wheat

Firstly, it was general concept that wheat crop is attacked by the mildew, blasting and blight, with the advancement of agriculture knowledge, conformed that rust is due to the fungal attack. Aristotle (384-322 B.C.) demonstrated that "warm vapors" are the main cause of rust and cause highly losses in the epidemic form in any country. Many scientists discuss the rust in unique way, Theophrastus reported that cereals crops were severely attacked the rust as compared to the legumes. First of all, the person who named Felice Fontana in 1767 demonstrated that rust diseases of the wheat caused by the fungi. But up to 19th century, there was not clear difference between the rust and smut diseases of the wheat crop. In the first report, it was not clear differences between leaf and stem rust of the wheat. De Candolle (1815) was the first person who described that wheat leaf rust was due a fungal pathogen and given name as *Uredo rubigo-ve-*



ra. Anton De Berry in the 1860s described the process of heteroecism of stem rust of wheat (*Puccinia graminis*) on different cereals and barberry crops as well. In some publication, it was given the concept to demonstrate that "blast" and "mildew" are the rust type fungal pathogens which may have the potential to affect the various cereals crops. The focus was directed to identification of wheat rust and their proper and integrated management in the 1880s, because both of these have basic science to control the highly losses, led Large (1940) to observe that "the greatest single undertaking in the history of plant pathology was to be the attack on rust in cereals".

Rust status in Pakistan

In Pakistan, many epidemics reports of stripe (*Puccinia striiformis*) and leaf (*Puccinia recondita*) have been reported in 1980s and 1970s respectively. Depending upon the susceptibility level of wheat cultivar, 10 to 100% yield losses have been recorded. During annual survey of wheat rust, stripe rust firstly appears in the farmer fields of central Punjab (Faisalabad) in mid-February which spreads to other areas of the Punjab on the highly susceptible cultivar due to moving of urediospores by the wind and air in the mid- March.

Comparison of leaf rust of wheat

Brown or Leaf rust (*Puccinia recondita*) of wheat is most deleterious as compared to other stripe and stem rust under the

natural conditions. Leaf rust first appear on the leaf blade, but under the presence of high amount of inoculum concentration, suitable environment and susceptible cultivar leaf sheaths also affected. *Puccinia recondita* is demonstrated by the uredinial stage producing urediospores which are round to ovoid, erumpent and having the 1.5 mm diameter with orange to brown shade that are freckled on upper and lower surface of the leaves of the wheat crop. Uredinia produced urediospores having 20 microns in diameter orange to brown in color, sub-globoid, with the eight spores which are freckled with the wall of urediospores.

Suitable environmental condition for leaf rust

It is demonstrated that brown rust (*Puccinia recondita*) cause a significant hazard to wheat production in the large area of the wheat production under the natural field condition. Rust fungi are the obligate parasite and need a living host for their proper growth and completion the life cycle. Existence in the off season, the rust in the form of teliospores survive on the barberry plants or either voluntary plants (self-own) become dormant and appear in the crop season and cause highly losses. High irrigation and incidence of the cool and rainy condition in the February – March month promote the inoculum to spread and cause severe diseases losses. Furthermore, suitable temperature, high level of humidity, aggressive pathogen and susceptible cultivars are

main component of the diseases spreading.

Control measures

But selection of resistant cultivars is the most effective method to control the rust disease of the wheat. But pathogens have the ability to change their race and effects the crops. Therefore, horizontal resistant should be introduced for the proper management of rust diseases.

Biological management of leaf rust of wheat

The bacterial strain, *Pseudomonas putida* have the capability to produce several types of antibiotics, siderophores and slight quantity of hydrogen cyanide (HCN), which suppress the *Puccinia recondita* growth in vitro and vivo. Some strains of the bacteria produce only hydrogen cyanide (HCN), which suppress the symptoms produced by the *Puccinia recondita* in the field as well as in lab trials. Different bio-control agents were evaluated against leaf rust of wheat with their combined effect and lonely. The bio agents like *V. lecanii*, *B. bassiana*, *P. fumosoroseus*, *M. anisopliae* and *C. cladosporiodes* were used against *Puccinia recondita* in the field and lab conditions. The results showed that *B. bassiana* and *V. lecanii* while *P. fumosoroseus* and *V. lecanii* showed the best results against the suppression of pustule size.

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M. Ahmad Zeshan

Physiological disorders of potato plant

Throughout the years, potato has turned into an imperative product for the both agriculturists and buyers in Pakistan. It is the fourth most critical harvest by volume of creation and it gives significant returns and exceptional yields to farmers. Potato having a high



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Throughout the years, potato has turned into an imperative product for the both agriculturists and buyers in Pakistan. It is the fourth most critical harvest by volume of creation and it gives significant returns and exceptional yields to farmers. Potato having a high nutritive esteem and these contributes more protein and iron than different vegetables in the normal eating regimen and are additionally helpful wellsprings of thiamine, niacin and a few different supplements including fiber.

The Potato crop in Pakistan is affected by many pests and diseases. The most damaging ones are growth cracking, enlarged lenticels, second growth, sprout tubers (secondary tuber formation), heat necrosis, blackheart.

Growth cracking:

Growth cracking is an external non-infectious physiological disorder of the potato tuber in which the tuber splits while growing. Growth cracks generally start at the bud or apical end of the potato and can extend lengthwise. Growth cracks make fresh-market tubers unattractive. Severe growth cracks can even impact the quality of chip potatoes and affect processing. Growth cracks form due to fluctuating environmental conditions, such as uneven soil moisture, soil and air temperature, and rapid water uptake and tuber growth. Growth cracks increase when relatively poor growing conditions, such as prolonged moisture stress or high temperatures followed by excessive irrigation or rainfall. Injudicious use of nitrogen fertilizer is applied in excess or when the application of nitrogen fertilizer is not properly timed. There is also a link between low boron levels in the soil and increased intensity

of growth cracks.

Enlarged Lenticels:

The lenticels, or natural pores, of the potato tubers are ordinarily inconspicuous slits on the tuber surface. These lenticels become enlarged when potato tubers are allowed to remain in wet soil after digging, or when freshly dug tubers are stored in a place where the air is very moist. When lenticels are enlarged, numerous scabs like openings appear on the tuber skin. The tissues around many of these small openings become raised and appear to be pushed out from below. Frequently this tissue becomes corky in appearance. The damage done to the tuber by enlargement of the lenticels is solely to its appearance.

Second Growth:

Second growth, often called knobby tubers, is a condition produced in potatoes most frequently when dry weather prevails during midseason and is followed by a rainy period. Some varieties, particularly those that produce long tubers, are more subject to knobiness than other varieties. The second growth occurs on the main or primary tuber at sites where eyes are located. These growths vary considerably in shape and size. No internal tuber symptoms or plant symptoms occur. In dry weather, tuber growth ceases. After a rainy period, growth begins again. When tuber growth resumes, it is not uniform. Proliferations, or knobs, occur at the site of one or more eyes. Sometimes affected tubers have pointed ends. This abnormal growth response may also occur as a result of irregular irrigation.

Sprout Tubers (Secondary Tuber Formation):

"Sprout tubers," "secondary tuber formation," or "potato-



es with no tops" are common names for second growth. This irregularity occurs when the rest period is completed in the spring after the seed is planted or when conditions are unfavorable for normal vegetative growth. A poor field stand is the first sign of secondary tuber formation. Although seed pieces are firm, a small, marble-sized potato has grown directly from an eye. If sprouts form, they are short and they terminate in new tubers.

Heat Necrosis:

Internal heat necrosis can be described as tan to brown spots in the parenchyma tissues of harvested tubers. The spots

first appear near the apical end of the tuber. This disorder also has been referred to as internal browning, physiological internal necrosis, internal brown fleck and chocolate spot. Symptoms generally are not observed on tubers or foliage, except some cultivars may express blackened eyes, tuber distortions and depressed skin or shrunken regions on the tuber surface.

Blackheart:

Blackheart is a physiological disorder caused by lack of oxygen, leading to dark, necrotic cavities. The symptoms are an irregular-shaped area that turns black to blue-black with a distinct

border. This disorder can occur during tuber development, before harvesting or in storage. During tuber development and harvest, conditions that favor low-oxygen availability such as compacted soils can lead to the development of blackheart. A water film surrounding the tuber (oxygen diffuses slowly through water) and water-logged soils also will favor blackheart development. Potatoes in storage can develop blackheart when bins are closed, piles are deep with poor ventilation, tubers are harvested when they are muddy or an excess of soil is in the storage facility, or when a water film covers the potato.

From page 5: Custard Apple: Intro and importance

Seed of this plant is also important due to mild toxic nature and containing of 30% oil. Seed is 1.25 cm long and 1 fruit contained average 64 seeds. It is used in the soap, paint pesticide, weedicide and pharmaceutical industries and in Bio-gas production due to trapped fatty acids rich in methyl-ester. Seed is also effective in the treatment of leukemia, liver cancer, prostate cancer, pancreatic cancer and cervical cancer.

Custard apple leaves are also treasured, because the leaves

are packed with fibers which are responsible for the balance of sugar level, with a high concentration of potassium and magnesium it also relaxes the muscles of heart and keep it healthy. The juice of leaves is also helpful in healing wounds.

The fruit is a storehouse of vitamin A, B and B6 with different minerals i.e. potassium, magnesium, phosphorus, iron, sodium, copper and dietary fibers. The first impact on the human body is by dietary fibers present in the fruit cause low leveling of cho-

lesterol which result in weight loss. It is also useful for gaining the weight, by using it with honey. The elevated level of iron present in the fruit also helpful in sanative anemia. Custard apple contains vitamin C which is healthful for eyesight. This fruit is also beneficial for the skin rejuvenation and hair growth, in the fruit and leaves, there were forty-nine volatile components identified, major volatile components are α -pinene, β -pinene and germacrene D. The smooth flesh of the fruit is used in ice

cream, can also added in the fruit salads. Overall, custard apple is health beneficial fruit and 1g of fruit have 100 calories.

But unfortunately, despite these beneficial aspects and availability of favorable conditions there is no commercial production of custard apple in Pakistan, production is only limited to Sindh. PARC (Pakistan Agriculture Research Council) is occupied for the maintenance of existing germplasm of custard apple in current research programs. Pakistan's agricultural institutes must develop their own

local varieties which are adoptable to this environment. Pakistan has developed those exotic varieties of different fruits which were not known earlier in our area. It is expected that there may be new germplasm imported from abroad for further research and these plants should also be introduced in the fields of growers for the supplementary source of income.

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No need to import furnace oil from 2019, Senate announced

THE SENATE was briefed that from next year, there will be no furnace oil import, as already renewable energy made up for 40 percent of total power generation. Mushahid Ullah Khan Minister for Climate Change Senator said this during the discussion in the House on a deferred motion moved by Senator Dr. Jehanzeb Jamaldini of the BNP-Mengal.

The minister played down the interests raised by Senator Jamaldini and some other lawmakers that the use of coal in power plants would be an immense risk to environment and life. He mentioned that the best possible supercritical technology was being used at the coal-power plants to deal with pollution.

He further added that coal-based power generation in the US was over thirty percent in China sixty percent and in India



forty percent whereas it was just 0.8 percent in Pakistan. He insisted that there was a lot of responsibility on the provinces and other ministries to do the demanding on coal-power plant-related matters.

Ahsan Iqbal Interior Minister said that no project was being executed without first having environmental impact study, stressing coal would be used under safe technology.

He further explained the use of coal and said that coal deposits

in Pakistan were enough for over 400 years. He made it clear that no coal power plant under CPEC was being set up, which would be a threat to the environment. Senators feared that coal-power plants would pose a threat to the environment as already China was shifting its plants to other countries. They also said that considerable quantity of water would be needed to cooling the towers. They called for focusing on wind and other options for power generation. ♦

HEC introduce HAT for scholarships and admission

THE HIGHER Education Commission (HEC) has released a Higher Education Aptitude test (HAT) which will be conducted by the Education Testing Council. This test is compulsory to attain HEC scholarships and get admission in MS/MPHil programme in public as well as private universities. The deadline for the online registration is January 31, 2018, at etc.hec.gov.pk. This HAT results will be durable for two years for all the applicants.

The applicants will be clear from a 100 percent grading system comprising 40 marks for quantitative reasoning, 30 marks for verbal reasoning, and 30 marks for analytical reasoning.

The HAT will be organized in four separate groups termed as HAT-1 for engineering and IT, HAT-2 for management science and business education, HAT-3



for arts and humanities and social sciences, and HAT-4 for agriculture and veterinary sciences, biological sciences, medical sciences and physical sciences.

The applicants have been guided to carefully select the correct HAT category according to their qualification. Also, they can choose their test center from the list that is available on the official website. The roll number slips will be issued to successful candidates through courier at the provided address and the same can also be downloaded from the e-portal after the completion of the due procedure. ♦

Pakistan's first Business & Biodiversity Platform launched



IUCN (INTERNATIONAL Union for Conservation of Nature), the Port Qasim Authority (PQA) and leading private sector companies of Pakistan jointly launched Pakistan's first Business and Biodiversity Platform (BBP) at a ceremony held at PQA.

The Platform is a unique initiative focusing on nature conservation through the collective support of the private sector.

The launching ceremony was organized at PQA and presided over by the Chairman PQA Agha Jan Akhtar. Attending the ceremony were the members of IUCN, leading businesses, the initiating members of the platform, environmental experts and representatives from Sindh Forest Department.

Speaking on the occasion, the Chairman PQA Agha Jan Akhtar said, "there are environmental issues associated with the industrial developments which are required to be addressed in order to avoid long-term impacts on the coastal ecosystems and people." Being a regulatory authority, he added, PQA is mandated to ensure that business operations are undertaken in environment friendly manner in the port area through mitigation of

negative impacts such as pollution, cutting of mangroves, degradation of fisheries resources and displacement of local communities.

"The establishment of Business & Biodiversity platform is indeed a positive step and a good opportunity for the private sector to step ahead to improve their brand image both locally and internationally with the support of reputable conservation organisations like IUCN," the Chairman concluded.

In his welcome address, Mahmood Akhtar Cheema, Country Representative, IUCN Pakistan, touched upon the environmental challenges Pakistan faces and shared IUCN's work over the last 30 years. He appreciated the efforts being made by several businesses in Pakistan that are taking a strategic view of the environment they are operating in. "The corporate sector has come together to invest a significant amount in CSR activities —so there is a realization that exists. IUCN in this regard serves as a technical partner to assist in platform in identifying key environmental issues and potential interventions," Cheema observed. ♦

PEC arranged IPEA's gathering with respect to Engineers' Registration System

PAKISTAN ENGINEERING Council (PEC) dealt with an overview meeting of the International Professional Engineering Agreement (IPEA), as for experts' enlistment plan of PEC, which was observed remotely through video interface by the IPEA selected reviewers from India, UK and Ireland.

Chairman PEC Khyber Pakhtunkhwa (KPK), Engr Zahid Arif, chaired the session along with various people from the PEC Enrollment Committee and four subject experts. PEC, in the wake of achieving the full signatory status of Washington Accord of

International Engineering Alliance (IEA) a year prior in June 2017, has associated for the last review of PEC enlistment of IPEA to empower across boarder mobility of engineer class from Pakistan.

Around 24 enrollment cases of engineers were shown to the committee, saw by the Internal IPEA investigators. The report will be assembled by observers to IPEA of IEA for their proposition and thought in the normal IEA meeting in intended to be held in June, 2018 at London, UK.

After the successful assess-



ment of PEC enlistment structure by the IPEA, PEC may be allowed to open and keep up enroll for International Professional Engineers title for Pakistani professionals, who can work professionally in any signatory country as world class engineers, in this way opening new business job market for Pakistani engineers. ♦

Iran interested in agribiz exchange with Pakistan



DELEGATION OF Iranian entrepreneurs of West Azerbaijan Province of Iran drove by Behnam Tajodinni, Head of the Agriculture Commission of the Urmia Chamber of Commerce and Industry visited Islamabad Chamber of Commerce and Industry and demonstrated distinct fascination to create solid exchange relations with Pakistan in agriculture items.

Talking at the event, Behnam Tajodinni said that West Azerbaijan was the third biggest area of Iran with one of the most astounding makers of agricultural commodities.

He said the area was delivering yearly 6 million-ton organic

products and vegetables, 1.2-million-ton apple, 380,000-ton grapes and 280,000-ton apricots with 326 frosty storerooms with capacity limit of 1 million tons.

He further told that the region was additionally on top in creating nectar and was a center point of import and fare exercises in Iran. He said the territory can possibly advance participation in the farming area with Pakistan.

He focused on that the agriculture segment representatives of the two nations ought to grow close collaboration to advance two-sided exchange of agro items amongst Iran and Pakistan.

Talking at the event, President of Islamabad Chamber of Commerce and Industry Sheik Amir Waheed, said that Pakistan and Iran delighted in great relations, however given the span of the economies of the two nations, their reciprocal exchange was far underneath the genuine potential. ♦

1LINK received Gemalto PURE White-Label EMV innovation for PayPak

1LINK, PAKISTAN'S biggest installment preparing body, reported its determination of Gemalto PURE white label installment innovation for empowering "Chip and PIN" for its Domestic Payment Scheme, PayPak.

The arrangement will empower 1LINK part banks to dispatch EMV-agreeable contact and contactless cards, versatile installments, Host Card Emulator (HCE) and other computerized administrations. This new activity will bring an additional security and comfort of 'Chip and PIN' exchanges to many cardholders.

MoU was signed by CEO 1LINK Najeeb Agrawalla, and SVP Middle-East, Africa Nassir Ghrou, and CIS Banking and Payment GEMALTO. ♦