

TECHNOLOGY ROUNDUP

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Tech News Headlines

- **Comparative Study on the Yield Performance of Sunflower Hybrids under Agro-Ecological Conditions of D.I.Khan, Pakistan**
- **Development and Physico-Chemical Characterization of Apricot-Datebars**
- **Silicon-Based Light-Emitting Diodes (SILEDs) can Emit Multicolour Light Without Heavy Metals**
- **Writing Without Keyboard: Handwriting Recognition on the Wrist**
- **New Way of Capturing Images Based on a Flat, Flexible, Transparent, and Potentially Disposable Polymer Sheet**
- **Xenon Flash for Photos in Dark from Smart Phones**

Forthcoming Tech Events

- **Workshops on Exploratory Topics in Plasma Fusion Research (EPR) 2013**
- **Worldwide Progress Towards Fusion Energy Symposium of AAAS 2013**
- **Pacific Operational S & T Conference and Exhibition**
- **40Th IOP Annual Plasma Physics Spring Conference**
- **Global Engineering Science and Technology Conference**

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Comparative Study on the Yield Performance of Sunflower Hybrids under Agro-Ecological Conditions of D.I.Khan, Pakistan

Sunflower seed contains high oil content ranging from 40-50 percent and is rich in protein 23 percent. Moreover, its oil quality is better due to higher percentage of linoleic acid and low percentage of linolenic acid which is the most desirable character lacking in other oils. Sunflower seed cake has proved to be good quality feed for dairy animals and particularly for poultry birds. Furthermore, sunflower is also a good source of nectar for honey production. Edible oil is an important component of human diet. Pakistan is deficient in edible oil production and a huge foreign exchange is spent on its import every year. Presently domestic production of edible oil is meeting only 35% of the total requirements which increases by 50-60 thousand tons per year due to rapid population growth expending. Urbanization increase in house hold income and limited availability of animal facts (Ali et al. 2000, Nadeem 1989, Ford 1978). Sunflower (*Helianthus annuus* L.) is an important edible oil crop ranking next to soybean. Sunflower is a drought tolerant and short duration crop and has a wider range of adaptability. Research work on this crop has shown that under Dera Ismail Khan agro-climatic conditions it can be grown successfully twice a year as spring and autumn crop both in irrigated and rain fed areas.

The present study was therefore under taken to determine different hybrids under Agro-ecology of D.I. Khan for finding out of the high yielding and comparatively early maturing hybrids for the economic uplift of the area farmers.

Eight Sunflower Hybrids representing diverse genetic back ground were evaluated for achene yield, 1000-Achene weight, plant height, and oil percentage and protein contents at Agronomic Research Area, Faculty of Agriculture, Gomal University, D.I. Khan, Pakistan during spring 2005. Hybrids were found significantly different from one other for all the traits studied in the experiment Hybrids kg ha⁻¹ Hysun-33 proved to be the best with maximum achene yield (2279.86 kg/ha) as compared to hybrids Sunbred-265 which gave achene yield of 1699 kg/ha. The highest 1000 achene weight was recorded from hybrid Hysun-33 while the remaining hybrids were at par with each other. Hysun-33 hybrid affianced tallest plants with 130 cm as compared to Sunbred-265 and Suncross-24 that were found shortest plants with 123 cm height each Maximum oil contents value (41.24 %) was noted in Hysun-33 while minimum oil contents value (36.17 %) was obtained from Suncross-24.

Maximum protein percentage (26.76%) was observed in Hysunb-33 which statistically at par with Dk4040 (25.95%). Minimum protein percentage (23.62%) was shown by Suncross-24 which also at par with NK-212 (23.82%) and sunbred-265 (23.73%) (Oral, E and K-Kara, 189).

Courtesy:

Sarhad J. Agric. Vol.28, No.2, 2012

Ejaz Ahmad Khan, and Ghazanfar Ullah Sadozai (Department of Agronomy) Faculty of Agriculture, Gomal University, D.I. Khan Pakistan). Saeed Ahmed Qaisrani and Nazir Hussain (Agricultural Research Institute, D.I. Khan Pakistan).

DEVELOPMENT and PHYSICO-CHEMICAL CHARACTERIZATION of APRICOT-DATE BARS

Pakistan is among top ten date (*Phoenix dactylifera* L.) producing countries. Dates are highly nutritious and their importance for human health is mentioned in Holy Quran. One hundred grams of date flesh contains 73.5g carbohydrates, 2.3g proteins, 1.5g and ash 0.2g fat. The dates also contain vitamin A, C, B1, B2, folic acid, nicotinic acid, mineral elements and are considered good source of energy mainly due to presence of high amount of readily digestible carbohydrates.

Mostly, fresh dates are used with little or no processing. However, several processed date products are now available in markets including date paste, date syrup, date pickle & Jam etc.

Apricots are also abundantly produced in Northern Area of Pakistan and their production stood at 238 thousand tons in 2008. These can be used as fresh, dried or inprocessed form. These are good source of carbohydrates and some important nutrients. One hundred grams of dried apricots provide 62.64g carbohydrates, 30.89g moisture, 2.57g ash, 3.39g protein, 0.51g fat (18), 55mg calcium, 2.66mg iron, 32mg magnesium, 71mg phosphorus, 10mg sodium and 1162mg potassium. These also contain vitamin A, C, thiamin, riboflavin and niacin.

Considering the nutritional qualities of dates and apricot, apricot-date bars were developed at the Institute of Food Science and Nutrition, University of Sargodha, Sargodha, Pakistan during the year 2009-10. For this purpose date paste, dried apricot paste, skim milk powder, roasted gram flour, peanuts and sodium chloride were used in different four proportions. The results indicated that water activity, colour and texture of bars were affected significantly with the addition of dried apricots. Moisture was also significantly affected which ranged from 17.14 to 19.21 percent and 71.49 to 72.81 percent whereas crude fat, crude protein, crude fibre, nitrogen free extract and ash

Tech News

were not significantly affected with the addition of apricot paste. The quantities of sodium, calcium, iron, manganese and zinc remained unchanged, whereas potassium increased significantly in these treatments. In-vitro protein and starch digestibilities ranged from 85.90 to 86.88 percent and 0.238 to 0.244 mg/g, respectively. There was no change observed in the quantities of free fatty acids. The total phenolic contents ranged from 225.20 to 263.84mg/100g. Microbiological analysis revealed that these bars were in the safe limits in bacterial and mold loads and might be stored for longer time. The studies further revealed that potential exists to produce economical fruit bars with commercial value.

Courtesy:

Journal of Agricultural Research, 2012 50(3): 409-421 ref 37

Salim-ur-Rehman (National Institute of Food Science and Technology, University of Agriculture, Faisalabad), Muhammad Nadeem (Institute of Food Science & Nutrition, University of Sargodha, Sargodha, Pakistan), Muhammad Haseeb, Javaid Aziz Awan (National Institute of Food Science and Technology, University of Agriculture, Faisalabad)

Silicon-Based Light-Emitting Diodes (SILEDs) can Emit Multi Colour Light Without Heavy Metals



Scientists of Karlsruhe Institute of Technology (KIT) and the University of Toronto/Canada have now succeeded in manufacturing silicon-based light-emitting diodes (SILEDs). They are free of heavy metals and can emit light in various colors.

Silicon nanocrystals have a size of a few nanometers and possess a high luminous potential. Silicon dominates in microelectronics and photovoltaics industry, but has been considered unsuitable for light-emitting diodes for a long time. However, this is not true for nanoscopic dimensions. Minute silicon

nanocrystals can produce light. These nanocrystals consist of a few hundred to thousand atoms and have a considerable potential to act as highly efficient light emitters.

Scientists specifically adjust the color of the light emitted by the diodes by separating nanoparticles depending on their size. Moreover, light-emitting diodes have a surprising long-term stability that has not been reached before. The increased service life of the components in operation is due to the use of nanoparticles of one size only. This enhances the stability of the sensitive thin-film components. Thus short circuits due to oversized particles are excluded. The development made by the researchers from Karlsruhe and Toronto is also characterized by an impressive homogeneity of the luminous areas. The KIT researchers are among the few teams in the world that know how to manufacture such devices. With the liquid-processed silicon LEDs that may potentially be produced on large areas as well as at low costs, the nanoparticle community enters new territory, the associated potentials of which can hardly be estimated today.

The SILEDs also have the advantage that they do not contain any heavy metals. In contrast to cadmium selenide, cadmium sulfide or lead sulfide used by other groups of researchers, the silicon used by this group for the light-emitting nanoparticles is not toxic. Moreover, it is available at low costs and highly abundant on earth. Due to their many advantages, the SILEDs will be developed further in cooperation with other partners.

www.esncienews.com

Writing Without Keyboard by Handwriting Recognition on the Wrist



Typing text messages on the mobile phone via the tiny soft keyboard is very cumbersome. How about simply writing it into the air! This idea drove the development of "airwriting" made by computer scientists of Karlsruhe Institute of Technology (KIT), Canada. Sensors attached to a glove record hand movements, a computer system captures relevant signals and translates them into text.

The airwriting glove is used to write letters into air, as if using an invisible board or pad. For this purpose, acceleration sensors and gyroscopes are attached to the thin glove. Contrary to systems based on cameras, these sensors are very small,

mobile, and robust. They record the movements of the hand and transmit them to a computer system via a wireless connection. The computer system first checks whether the user is indeed writing. All movements that are not similar to writing, such as cooking, doing laundry, waving to someone, are ignored. The system runs in the background without interpreting every movement as computer input. The computer scientist thinks that the device is perfectly suited for future mixed-reality applications. For instance, in glasses with integrated miniaturized screens, news may be displayed

to the user in the field of vision. When such a system is combined with the possibility to input commands and texts by gestures, you do not even need a hand-held device.

During writing, the airwriting system decodes the letters by a pattern recognition method. Previous approaches mainly focused on the recognition of single gestures assigned to certain commands. This approach goes far beyond. For every letter of the alphabet, a statistical model of the characteristic signal pattern is stored. It also takes into account individual differences in the writing style. The system can recognize complete sentences written in capital letters and presently has a vocabulary of 8000 words. The system has an error rate of 11%. When it is adapted to the individual writing style of the user, the error rate drops to 3%. Scientists are now working on further refining the method to filter out writing. Moreover, they want to make the system smaller in order to increase wearing comfort and user acceptance.

This can be achieved with commercial components. An unobtrusive wrist band might be feasible, for example," says the researchers. It is also planned to integrate the system in smart phones. In this case, neither the wrist band nor the tiny soft keyboard would be required to write a text message.

www.I4u.com

New way of Capturing Images Based on Flat, Flexible, Transparent, and Potentially Disposables Polymer Sheet



Digital cameras, medical scanners, and other imaging technologies have advanced considerably during the past decade. Continuing this pace of innovation, an Austrian research team has developed an entirely new way of capturing images based on a flat, flexible, transparent, and potentially disposable polymer sheet.

The new imager, which resembles a flexible plastic film, uses fluorescent particles to capture incoming light and channel a portion of it to an array of sensors framing the sheet. With no electronics or internal components, the

imager's elegant design makes it ideal for a new breed of imaging technologies, including user interface devices that can respond not to a touch, but merely to a simple gesture.

It is the first image sensor that is fully transparent no integrated microstructures, such as circuits and is flexible and scalable at the same time. The sensor is based on a polymer film known as a luminescent concentrator (LC), which is suffused with tiny fluorescent particles that absorb a very specific wavelength (blue light for example) and then reemit it at a longer wavelength (green light for example). Some of the remitted fluorescent light is scattered out of the imager, but a portion of it travels throughout the interior of the film to the outer edges, where arrays of optical sensors (similar to 1-D pinhole cameras) capture the light. A computer then combines the signals to create a gray-scale image. With fluorescence, a portion of the light that is remitted actually stays inside the film.

For the luminescent concentrator to work as an imager, the researchers had to determine precisely where light was falling across the entire surface of the film. This was the major technical challenge because the polymer sheet cannot be divided into individual pixels like the CCD camera inside a smartphone. Instead, fluorescent light from all points across its surface travels to all the edge sensors, calculating where each bit of light entered the imager .

The solution came from the phenomenon of light attenuation, or dimming, as it travels through the polymer. The longer it travels, the dimmer it becomes. So by measuring the relative brightness of light reaching the sensor array, it was possible to

calculate where the light entered the film. This same principle has already been employed in an input device that tracks the location of a single laser point on a screen.

The researchers were able to scale up this basic principle by measuring how much light arrives from every direction at each position on the image sensor at the film's edge. They could then reconstruct the image by using a technique similar to X-ray computed tomography, more commonly known as a CT scan.

Currently, the resolution from this image sensor is low (32x32 pixels with the first prototypes). The main reason for this is the limited signal-to-noise ratio of the low-cost photodiodes being used. The researchers are planning better prototypes that cool the photodiodes to achieve a higher signal-to-noise ratio.

The main application that researchers envision for this new technology is in touch-free, transparent user interfaces that could seamlessly overlay a television or other display technology. This would give computer operators or video-game players full gesture control without the need for cameras or other external motion-tracking devices. The polymer sheet could also be wrapped around objects to provide them with sensor capabilities. Since the material is transparent, it's also possible to use multiple layers that each fluoresce at different wavelengths to capture color images.

The researchers also are considering attaching their new sensor in front of a regular, high-resolution CCD sensor. This would allow recording of two images at the same time at two different exposures. "Combining both would give us a high-resolution image with less overexposed or underexposed regions if scenes with a high dynamic range or contrast are captured.

www.gizmag.com

Powerful Xenon flash in Short Phones could help to get Photos in Dark



A Singapore invention looks set to equip mobile phones with a built-in, small yet powerful Xenon flash, allowing consumers to take great photos even in low-light conditions.

Scientists from Nanyang Technological University (NTU), Singapore have made a revolutionary capacitor that overcomes the limitations of current capacitors, which are needed to store enough energy to fire a powerful flash like those found on digital cameras but are too big to fit in slim mobile devices.

Made from polymers layered together, the new capacitor is at least four times smaller than current electrolytic capacitors and is several times

faster than current ceramic-based capacitors. The multi-layered polymer capacitor is also able to deliver the same electricity charge needed to power high-intensity xenon flash light matching those found in digital cameras.

Polymer capacitors such as the one developed by these researchers, generally possess a higher energy density than ceramic-based multilayer capacitors. NTU's new material, a grafted co-polymer that stores charges similar to a multilayer ceramic capacitor, can be operated at high voltages. Capacitors made using this grafted co-polymer are flexible and much smaller than the conventional capacitors. In addition, the charge and discharge times of the capacitor are faster than other types of energy storage devices making it suitable for flash applications.

Currently, the polymer Capacitor project is funded by Singapore's National Research Foundation (NRF) Proof-of-Concept grant. The NTU-Xenon is expected to develop a working commercial prototype by September 2013. Through the University's Nanyang Innovation and Enterprise Office, NTU and XT entered into a Collaboration Agreement to research and develop a Multilayer Polymer Capacitor for xenon flash imaging applications. This project will yield a breakthrough

solution for the digital imaging industry, which will be the world's smallest Xenon flash. Prof. Lee whose researchers had worked on the invention for the past two and a half years, hopes that this collaboration is XT will accelerate the transfer of her innovation from research lab to industry. She said that, “With XT's expertise in developing successful commercial products, they are confident that this collaboration will result in a descriptive innovation, not just in the area of flash technology, but also in the world consumer electronics, as well computer and devices requires the use of capacitors in one way or another”.

Www.esncenews.com

Forthcoming Tech Events

Workshop on Exploratory Topics in Plasma Fusion Research (EPR) 2013

12-15 February 2013,

Fort worth Texas USA

www.iccworkshops.org

Worldwide Progress towards Fusion Energy Symposium of AAAS 2013

16 February, 2013

Boston, Massachusetts, USA

www.iter.org

Pacific Operational S & T Conference and Exhibition

5-8 March, 2013

Hilton, Hawaiian Village, USA

www.ndia.org

40Th IOP Annual Plasma Physics Spring Conference

25-28 March, 2013

York, UK

www.laserlab-europe.eu

Global Engineering Science and Technology Conference

1-2 April, 2013

Dubai, UAE

Www.gistconfo.com

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