



PLUTUS ACADEMY

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1. Bio-Decomposer spraying to counter Stubble Burning in Delhi

Delhi Chief Minister Arvind Kejriwal announced that the Delhi Government is to adopt “Bio-Decomposer” spraying to counter stubble burning.

Highlights

The scientists at the Indian Agricultural Research Institute, PUSA have found a low-cost, effective way to deal stubble burning problem called bio-decomposer spraying. The Delhi Government is to adopt the solution from October 11.

About Bio-Decomposer Spraying

The scientists have discovered bio-decomposer capsule. These capsules when sprayed on crop residue will turn them into manure. This increases soil fertility and reduces use of fertilizers. According to the estimate of the Delhi Government, only Rs 20 lakhs is required to manage 700 hectares of stubble through this method. This cost includes cost of preparation, transportation and spraying.

Background

The stubble burning from neighbouring states contribute to 44% of Delhi Pollution. Stubble Burning is the burning of crop residue after harvest. The left over crop residue are called stubbles.

What is the issue?

Farmers have very short duration to prepare their field to plant the next winter crop (the rabi crop) after the harvest of monsoon crops (kharif crops). Thus, they set on fire to the crop residue after harvest. The retreating monsoon that is bounced back by the Himalayas carries the smoke from the states of Punjab and Haryana. As it reaches Delhi, it gets slowed down by the buildings in Delhi. This forces the monsoon winds to deposit the smoke here in the National Capital Region. This leads to smog during winter.

Waste Decomposers

Earlier the National Centre of Organic Farming developed waste decomposers. The waste decomposers are used for quick composting from organic waste. It mainly consists of microorganisms extracted from desi cow dung and thus are farmer friendly.

The waste decomposers were validated by the Indian Council of Agricultural Research. A single bottle of 30 grams of waste decomposer costs just Rs 20 and can decompose 1000 metric tonnes of waste in just 30 days.

2.Nobel Prize for Physics, 2020

The Nobel Prize, 2020 for Physics has been awarded to Andrea M Ghez, Roger Penrose and Reinhard Genzel for their research on black holes.

Highlights

Roger Penrose was honored for the discovery that black hole formation is a robust prediction of the theory of relativity. In simple words, the theory of relativity led to the discovery of black holes. Andrea Ghez and Reinhard Genzel have been honored for the discovery of a supermassive object at the centre of the Milky Way Galaxy. They discovered that the Milky Way has a supermassive black hole at the centre.

Andrea becomes the fourth woman to receive the Nobel Prize in the category of physics. The prize money of 10 million USD is to be shared between the three scientists.

Background

So far, only three women have won the Nobel Prize for Physics. They were Marie Curie (1903), Maria Goeppert-Mayer (1963) and Donna Strickland (2018). Marie Curie had also won Nobel Prize for Chemistry in 2011 and is the only woman to win the prize in two categories.

About Nobel Prize for Physics

The only Indian who has received the Nobel Prize for Physics was Sir C V Raman in 1930. He discovered the Raman Effect. The Nobel Prize for Physics was not awarded in six years. This was in 1916, 1931, 1934 and in 1940, 1941 and 1942 because of world wars.

Raman Effect

It is the scattering of light particles by molecules in a medium. This occurs as the wavelength of light changes as it enters a medium.

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3. QUAD Foreign Ministers meet held in Tokyo

The foreign ministers of India, Japan, US and Australia held the Quad foreign ministers meet. India was represented by the External Affairs minister S JaiShankar.

Key Highlights

The meeting mainly focused on security challenges in the Indo-Pacific region.

Indo-Pacific Region

The Indo-Pacific Region is largely viewed as area that comprises of western and central Pacific Ocean, Indian Ocean including South China Sea.

Issues in South China Sea

The Chinese claims in the South China Sea are countered by Vietnam, Malaysia, Philippines, Brunei and Taiwan. The Chinese efforts towards India Ocean is seen to have challenged international rules-based system. Japan has increased its concerns over the activities of China over the disputed Senkaku Islands.

4. Amazon at the risk of changing from Forest to Savanna

A team of Europe based scientists have recently found that the tropical forests, especially the Amazon forest are slowly changing into Savannah like environment.

Highlights

According to the study around 40% of Amazon forest are at the risk of changing into Savannah like environment. This is mainly because of increased Greenhouse gas emissions and reduced rainfall.

The shrinking forests tend to lose their ability to absorb man-made emissions and thereby adding up to global warming.

Key findings

Many of the rainforests in the world are also growing into Savana like grasslands. The study has found that apart from Amazon forest, the forests in Congo Basin are also at the risk of changing into Savannah. The rainforests are highly sensitive to global climate change and also lose their ability to adapt very quickly. Once lost, it will take decades for the rain forests to return to their original state according to the report.

Savannah

These forests are characterized by wet summers and dry winters. They have high annual range of temperature. They hold sparsely populated trees with tall grasses. Forest fires are frequent in Savanna.

Savannah type of climate is most common in Sudan and hence it is also called Sudan climate.

Amazon forests

The Amazon is the biggest rainforest in the world. The forest is estimated to hold 15,000 tree species and 390 billion individual trees. Two thirds of the Amazon rainforest is found in Brazil.

Forest fires in Amazon

The increasing forest fires in Amazon forest is yet another proof for the forest turning into Savannah. In 2019 Brazil spotted more than 9500 new forest fires in the region.

In 2019 there was an 85 percent increase in forest fire as compared to 2018. The main reason behind the depletion of Amazon forest is the new policy adopted by Brazilian government. Brazil has been opening up Amazon forests towards business interests and to allow agricultural mining and logging operations in the region. This is being done to boost the GDP of the country.

5.NCERT and ISLRTC to sign MoU to help deaf children access education material

The National Council of Education Research and Training (NCERT) and Indian Sign Language Research and Training Centre signed a Memorandum of Understanding (MoU) to make the education material accessible to the deaf children.

Highlights

Under the MoU, educational print materials, teachers' handbook, supplementary materials and NCERT Textbooks are to be converted into sign language in digital

format. Apart from these other supplementary materials and all the other resources of Class I-XII of all subjects of both Hindi and English medium are to be converted.

The step is a part of the mandate of New Education Policy, 2020. The policy claimed to standardize Indian Sign Language. It will enhance the literary skills of the deaf children greatly.

Gol measures

The Gol has been taking several measures recently to help the deaf people. The Ministry of Social Justice and Empowerment recently launched the second edition of Indian Sign Language Dictionary. The dictionary was developed by the Indian Sign Language Research and Training Centre. IT includes 6000 words under categories such as legal, academic, medical, every day terms and technical. The dictionary is available in both video and printed formats.

Census 2011

According to Census 2011, around 18.9% of the Indian population is deaf.

International Day of Sign Languages

It is celebrated on September 23 every year. This is because the World Federation of the Deaf was formed on September 23.

World Federation of Deaf

It is an NGO and acts as a peak body for the National associations of deaf people spread all over the world. The World Congress organised by the World Federation of the Deaf is held every four years.

The organization aims to improve the status of national sign languages, improve access to information and services and promote establishment of deaf organizations. The National Association of the Deaf, India is associated with the World Federation of Deaf.

6.PARAM Siddhi-AI: India's fastest AI Supercomputer

The Centre for Development of Advanced Computing (C-DAC) commissioned the largest HPC-AI supercomputer. HPC-AI is High Performance Computing and Artificial Intelligence.

Highlights

PARAM-Siddhi has put India among top countries in global AI supercomputing research and innovation. The supercomputer will accelerate cyber security, education, health care, education, space, agriculture and automotive. It will help in catalyzing partnerships with MSMEs, Start ups, Academia and Industries.

India has been implementing the National Supercomputing Mission to build a network of 70 supercomputers.

Super Computers in India

The first super computer that was built under the National Supercomputing Mission was named "Param Shivay". It was also built by C-DAC. Param Shivay used more than 1,20,000 compute cores and 833 TeaFlops. TeaFlop is a measure of the processing speed of a computer.

The IIT-Kharagpur was the first institute to get a supercomputing facility under the National Supercomputing Mission.

Global Ranking of Indian Supercomputers

The SuperComputers in the world are ranked based on their speed. The following are Indian Super computers and their world ranking

- Pratyush: It holds 39th position and is operated under the speed of 4,006 TFlop/sec. It is located in Indian Institute of Meteorology.
- Mihir: It holds 66th It operates at a speed of 2,808 TFlop/sec. It is located in the National Centre for Medium Range Weather Forecasting.
- InC1: 206th rank, 1,413 TFlop/sec.
- SERC: SERC is Supercomputer Education Research Centre at Indian Institute of Science. 327th rank, operating at 1,244 TFlop/sec.
- iDataPlex: 496th rank operating at a speed of 790 TFlop/sec.

World Fastest SuperComputer

Fugaku of Japan is the world's fastest supercomputer. The operating speed of Fugaku is 415 petaFlops. Peta is 10^{15} (a thousand million million).

National SuperComputing Mission

The Mission aims to develop the national research and development institutions spread over the country by installing a vast supercomputing grid with more than 70 high-performance computing facilities. The mission is implemented by C-DAC.

7.New Emission Norms of Tractors, Construction Vehicles extended till October 2021

The Government of India has extended the applicability of new emission norms for tractors and construction equipment vehicles till October 2021. These norms were to be applicable from October 2020.

Key Highlights

The Ministry of Road Transport and Highways is bringing in the extension of date through the amendment to CMVR. CMVR is Control Motor Vehicle Rules. Under this

new amendment, the applicability date to implement the next stage of emission norms for tractors (TREM Stage IV) is being extended to October 2021.

The amendment provides separate emission norms for the agricultural machinery such as power tillers, tractors and harvesters and construction vehicles.

Also, the nomenclature of the emission norms of tractors and other equipment has been changed from Bharat State (CEM/TREM) IV and Bharat State (CEV/TREM)-V to TREM Stage IV and TREM Stage V.

TREM is Transport Emergency and CEV is Construction Equipment Vehicle.

Background

The first standard for agricultural tractors called the Bharat (TREM) Stage I was implemented in 1999. Later, Bharat (TREM) Stage III A was adopted harmonising agricultural tractors and construction machinery under engine category.

In 2018, the Bharat State (CEV/Trem) IV was adopted for emission standards for engines used in construction and agricultural equipment. The BS IV are aligned with European Union Stage IV standards.

Bharat (CEV/TREM) Stage IV

The engines that are equipped with Selective Catalytic Reduction (SCR) should meet ammonia emission limit of 25 ppm for engines operating at less than 56 KW. The engines operating at more than 56 KW should meet ammonia emission of 10 ppm. The Particulate Matter emitted by the engines should be 0.025 gram per KWh irrespective of their power. The Carbon Monoxide emitted should be 5.0 g/KWhr for engines with power less than 130 KW and is 3.5 for engines with power greater than 3.5 g/KWhr

Also, they should pass the NRSC And NRTC tests

NRSC and NRTC tests

NRSC is Non-road Steady State Cycle test and NRTC is Nonroad Transient Cycle test.