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1. A new biocontrol agent to manage 'foot rot' disease in Basmati crop: Why this matters

Why in News?

The Punjab Agricultural University (PAU), Ludhiana, has developed biocontrol agent *Trichoderma asperellum* (2% WP), and registered it with the Central Insecticides Board and Registration Committee (CIBRC). The biocontrol agent will help Punjab farmers manage the deadly 'foot rot' or 'bakanae' disease that plagues the crops of Basmati rice, varieties of fragrant rice that are popular world over.

Foot rot

Rice is cultivated in two stages. Seeds are first sown in a nursery bed, where they sprout and grow into seedlings, which are then transplanted into a well-puddled and prepared field. Foot rot is a fungal disease that affects Basmati rice crops particularly at the seedling stage, though it might also cause infection after transplantation in case infected seedlings are transplanted.

Foot Rot or Bakanae Disease of Rice



It is caused by the fungus *Fusarium verticillioides*, a soil-seed borne pathogen which spreads the infection through the root of the plant, and eventually leads to the colonisation of the stem base. Infected seedlings first turn pale yellow, then elongate and dry up, and eventually (usually) die.

The prevalence of foot rot in the Basmati crop reduces yields and threatens the state's export prospects. In some cases, farmers need to uproot their entire transplanted seedlings.

Current management practices

To prevent the disease from occurring and spreading, farmers resort to early seedling treatment, try and use disease-free seeds, and destroy infected seedlings. Timely seed nursery management is crucial — experts recommend seed sowing in the first fortnight of June, and transplantation in July. Sowing in May often leads to problems as the month's high temperatures are favourable to the disease. Fields where the nursery is being set up must also be well-drained, with proper irrigation, to avoid the spread of foot rot.

Currently, seedlings are treated with *Trichoderma harzianum* before sowing and transplantation. Seeds are also treated with fungicides such as Sprint 75 WS (carbendazim + mancozeb) before sowing. But these are the chemical treatments which are harmful for the

soil, and can be toxic for consumers of the rice. The fungicide carbendazim is already banned in Punjab because it leaves behind high residues.

PAU's solution to tackle foot rot

This is where PAU's newly-developed biocontrol agent comes in. *Trichoderma asperellum* is ecofriendly in nature. This biocontrol agent offers a non-chemical alternative to traditional pesticides, aiding in disease management while minimising environmental harm.

The use of *Trichoderma asperellum* showed "excellent results" during the experimental phase, as a means to combat foot rot "without leaving harmful residues on the crop" and "compromising environmental safety". It can be used to treat both the seeds and the seedlings.

Challenge

The challenge now is to ensure the distribution of this agent among farmers. MOU has been signed with a private company for the large-scale manufacturing and distribution of *Trichoderma asperellum*, with the aim of making it available to farmers from the coming season. This would be a major development in Punjab, which, along with Haryana, accounts for more than 70% of India's basmati exports.

Relevance: GS Prelims; Environment

Source: Indian Express

2. West Nile fever cases detected in Kerala: What is the disease, how can it be prevented?

Why in News?

The Kerala government recently said that cases of West Nile fever have been reported from three districts in the state – Thrissur, Malappuram and Kozhikode. One person died of the viral disease on Monday and six other cases have been reported in recent days.

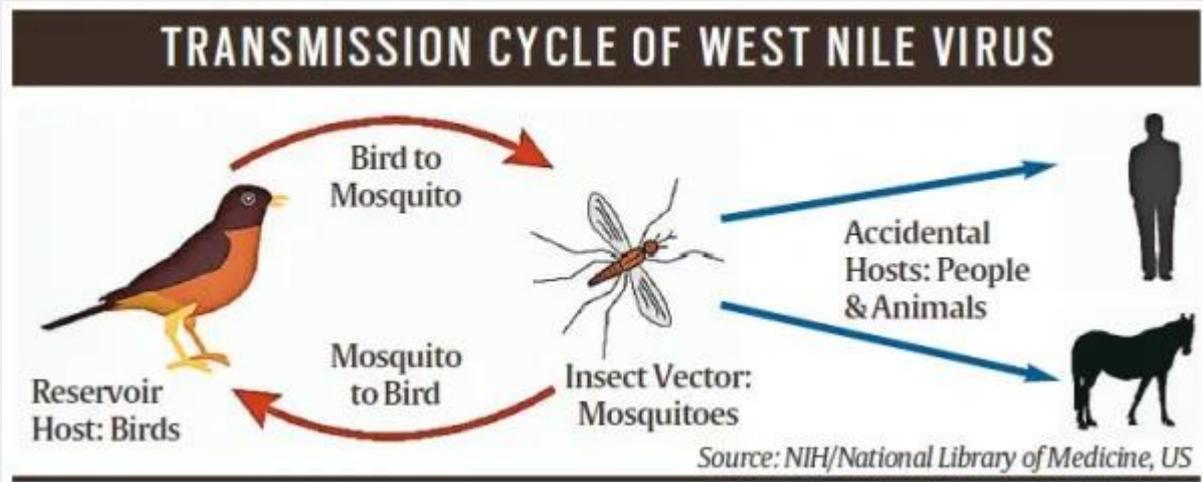
According to the health department, West Nile virus can cause a fatal neurological disease in humans. However, approximately 80 percent of those infected will not show any symptoms.

What is the West Nile Virus?

The West Nile Virus (WNV) is a mosquito-borne, single-stranded RNA virus. It is a flavivirus and is related to the viruses that cause Japanese encephalitis and yellow fever.

How does the West Nile Virus spread?

Culex species of mosquitoes act as the principal vectors for transmission. Infected mosquitoes spread the disease among humans and animals, including birds, which are the reservoir host of the virus.



Mosquitoes become infected when they feed on infected birds, which circulate the virus in their blood for a few days. The virus eventually gets into the mosquito's salivary glands. During later blood meals (when mosquitoes bite), the virus may be injected into humans and animals, where it can multiply and possibly cause illness.

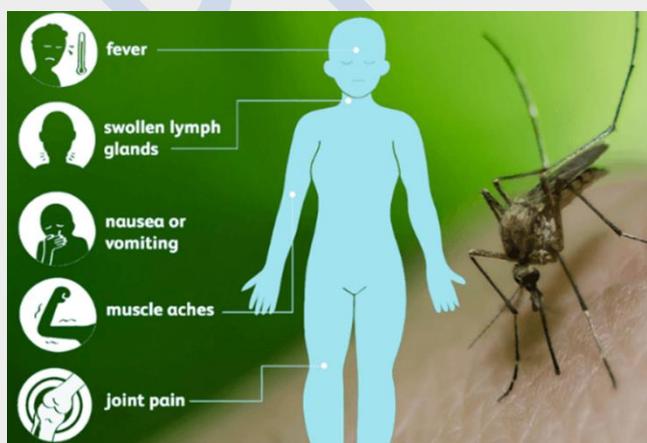
WNV can also spread through blood transfusion, from an infected mother to her child, or through exposure to the virus in laboratories. It is not known to spread by contact with infected humans or animals.

According to the US Centers for Disease Control and Prevention (CDC), it does not spread "through eating infected animals, including birds."

The CDC notes that the incubation period for WNV disease is typically 2 to 6 days, but can range from 2 to 14 days, and can be several weeks in immunocompromised people.

To date, no human-to-human transmission of WNV through casual contact has been documented.

What are the symptoms of West Nile fever?



The disease is asymptomatic in 80% of the infected people. The rest develop what is called the West Nile fever or severe West Nile disease. For them, the symptoms include fever, headache, fatigue, body aches, nausea, rash, and swollen glands.

It usually turns fatal in persons with comorbidities and immunocompromised persons (such as transplant patients). But the death rate is relatively low compared to Japanese encephalitis,

which shows similar symptoms.

What is the treatment for West Nile Virus disease?

No WNV-specific prophylaxis, treatment or vaccine is available. Only supportive treatments are given to neuroinvasive WNV patients. Health authorities globally advise for personal protective measures to reduce the risk of mosquito bites, such as using mosquito repellents. Public health departments are to also ensure larval source reduction, especially at breeding and resting sites for the mosquito vectors.

What are some preventive measures against West Nile Virus?

In most countries, the peak for WNV infections generally coincides with the period when mosquito vectors are most active and the ambient temperature is sufficiently high for virus multiplication. Since WNV outbreaks in animals precede human cases, the establishment of an active animal health surveillance system to detect new cases in birds and horses is considered essential.

Health Minister George also suggested wearing clothing that completely covers the body, use of mosquito nets and repellants, and keeping one's home and surroundings clean.

Why is it called West Nile Virus?

The virus was first isolated in a woman in the West Nile district of Uganda in 1937. It was identified in birds (crows and columbiformes like doves and pigeons) in the Nile delta region in 1953. Before 1997, WNV was not considered pathogenic for birds, but then, a more virulent strain caused deaths of different bird species in Israel, presenting signs of encephalitis and paralysis.

WNV outbreak sites are found along major bird migratory routes. Today, the virus is found commonly in Africa, Europe, the Middle East, North America, and West Asia.

Relevance: GS Prelims; Science

Source: Indian Express

3. Arvind Kejriwal released on interim bail: the case so far, what now

Introduction

The Supreme Court (SC) granted interim bail to Delhi Chief Minister Arvind Kejriwal on May 10. The Delhi Chief Minister was arrested on March 21 by the Enforcement Directorate (ED), due to his alleged connection to the Delhi excise policy case. This made him the first sitting chief minister in India to be put behind bars. Why was Kejriwal arrested? What has led to his release? And what now?

Arrest, allegations, and bail rejections

Between November 2, 2023 and March 21, 2024 the Delhi Chief Minister skipped 9 summons issued by the ED in connection to the excise policy case. In the last instance, Kejriwal filed a petition at the Delhi High Court seeking directions for "no coercive action" to be taken against him by the ED in connection with the case. However, the bench stated that it was not inclined to grant protection "at this stage".

Hours after the hearing, the ED entered Kejriwal's home and arrested him. Shortly afterward, on March 22, he was produced before a Delhi court which remanded him to ED custody till March 28. The ED claimed that Kejriwal was the "kingpin and key conspirator on the Delhi excise scam" in which multiple AAP leaders have been accused of receiving kickbacks from liquor businessmen in exchange for favors. This custody was extended on multiple occasions, most recently on May 7, when it was extended till May 20.

Meanwhile, the Delhi High Court rejected his petition challenging the arrest on April 9, leading to Kejriwal to approach the SC on April 10. The case was heard by a SC bench.



Supreme Court hearing and interim bail

At the SC, Senior Advocate Abhishek Manu Singhvi appeared on behalf of the Delhi CM and argued that there was no need to arrest Kejriwal as none of the key documents "even remotely" connected Kejriwal to the excise scam. Singhvi also questioned the timing of Kejriwal's arrest, considering that he was arrested in March 2024 even though the allegedly incriminating statements that the ED were relying upon to justify the arrest were all made between December 2022 and July 2023. Singhvi requested the bench to grant interim bail till June 4, when the election results would be announced.

The apex court on May 3 first expressed an inclination to grant bail to Kejriwal, mentioning the fact that he was an elected Chief Minister as opposed to a habitual offender, while also making mention of the general elections. However, during the May 7 hearing the Bench clarified that if Kejriwal was released on interim bail, it would be conditional upon him not being allowed to perform his official duties as Delhi Chief Minister.

Government advocates argued against releasing Kejriwal on interim bail, cautioning against setting a precedent for politicians being released on bail to conduct campaign activities. They even argued that politicians could not be favoured compared to other litigants. Further, he argued that such an order could have larger implications, mentioning the case of Amrit Pal Singh, leader of pro-Khalistani outfit Waris de Punjab, who has expressed his intention to contest elections despite currently being imprisoned. He too is seeking bail at the moment.

The Bench on May 10 decided to grant Kejriwal interim bail until June 1, the day that voting for the 2024 Lok Sabha elections will close. The SC rejected the argument that granting interim bail to Kejriwal would place politicians in a "benefic" position compared to other citizens, stating that the courts "always take into consideration the peculiarities associated with the person in question and the surrounding circumstances". In this instance, the court noted that the General Elections is the most "significant and important event this year" and are of "prodigious importance".

Relevance: GS Prelims & Mains Paper II; Governance
Source: Indian Express

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