19 pesticides that keep farmers awake at night

ISSAC JAMES MANAYATH @ Chennai

SLEEP has been the focus of a lot of research recently. Not getting enough sleep is being linked to a whole range of health issues. While sleep problems are often seen as an 'urban issue', they are also quite common in the countryside, especially among farmers.

In 2019, researchers from Ningxia Medical University in Yinchuan, China, did a study on greenhouse farmers in Yinchuan. They found that farmers with high exposure to pesticides had shorter sleep, worse sleep quality, and trouble sleeping. Another study by University College Dublin, which involved more than 300 Irish farmers, found that 50.1% of them reported having sleep problems. The Texas Farm Bureau says, "Farmers and ranchers often experience significant sleep deprivation, particularly during busy seasons like planting, harvesting, and calving."

While stress and long working hours are the main reasons farmers don't get enough shut-eye, other factors, like pesticide use, also need to be considered.

Many recent studies have found a link between pesticide exposure and sleep problems in farmers.

A large study conducted among 27,000 farmers in northern Thailand also showed this connection. Researchers from Naresuan University in Phitsanulok, Thailand, collected data on the use of 38 different pesticides among farmers through questionnaires.

What makes this study interesting isn't that it found a link between sleep disorders and pesticide use — it also looked at which individual pesticides might be more harmful to farmers' sleep quality.

"The study found a positive link with 19 individual pesticides (12 insecticides, 2 herbicides, and 5 fungicides). Some of the links showed a dose-response pattern," the researchers explained. This study was published in the journal *Heliyon*.

The participants were from three northern provinces of Thailand: Phitsanulok, Nakhon Sawan, and Chiang Mai. "Thailand relies heavily on pesticides to control weeds, insects, and fungi," the researchers wrote. But pesticide use is poorly regulated, and many farmers don't fully understand the best practices. "As our previous research found, most Thai farmers have limited knowledge about pesticides and their safe use, putting them at high risk of exposure and toxic effects," the researchers added.

The insecticides identified as problematic by the researchers are:



File photo of a farmer spraying pesticides in in Edakkudi near Mayiladuthurai in TN's Nagapattinam district | K VENKATESH

- **Three organochlorines:** chlorpyrifos, chlordane, and dichlorodiphenyltrichloroethane. Studies have shown that organochlorines are highly toxic to humans, animals, and the environment. A 2018 study by US researchers found links between organochlorine exposure and sleep problems like sleep apnoea among farmers.
- **Five organophosphates:** ethyl p-nitrophenyl phenylphosphorothioate, folidol, methamidophos, mevinphos, and profenofos. Like organochlorines, organophosphates are highly toxic. A 2023 study published in the Journal of Ecotoxicology and Environmental Safety found links between organophosphates and sleep issues.
- **Three carbamates:** carbaryl, carbofuran, and methomyl
- **Imidaclopric:** a type of insecticide.

> For individual pesticides, significant associations (with sleep issues) were observed in 19 out of 38 individual pesticides
> — Study report

Apart from insecticides, certain herbicides — especially paraquat and diuron — were also found to be a problem. "This finding is fairly new, as there aren't many large-scale studies to compare it to. But laboratory studies and related research back up our discovery. Specifically, this study found that exposure to either paraquat or glyphosate significantly increased the risk of sleep problems," the researchers said.

Among fungicides, the research identified five that are the most detrimental to sleep quality: benomyl, Bordeaux mixture, carbendazim, copper sulphate, and metalaxyl.

Another key finding is that women are at a higher risk of sleep-related issues with pesticide exposure compared to men.

Ind Exp pg 20

ಸಮಸ್ಯೆ ಹವಾಮಾನ ವೈಪರೀತ್ಯದ ಕಾರಣ ಬೆಳೆ ನಷ್ಟ

ಅಡಕೆ ಫಸಲಿಗೆ ಭಾರಿ ಹೊಡೆತ: ಉತ್ಪಾದನೆ ಶೇ.50ರಷ್ಟು ಕುಸಿತ!

• ಆತ್ಮಭೂಷಣ್
ಕನ್ನಡಪ್ರಭ ವಾರ್ತೆ ಮಂಗಳೂರು

ಅಡಕೆ ಉತ್ಪಾದನಾ ಕ್ಷೇತ್ರದಲ್ಲಿ ಈ ವರ್ಷ ಕಂಡುಕೇಳರಿಯದ ಭಾರಿ ವಿಪ್ಲವ ಕಂಡುಬಂದಿದೆ. ಹಳದಿ ಎಲೆ ರೋಗ, ಎಲೆಚುಕ್ಕಿ ರೋಗದಿಂದ ಕಂಗಾಲಾದ ಬೆಳೆಗಾರರಿಗೆ ಹವಾಮಾನ ವೈಪರೀತ್ಯದ ಶಾಕ್ ತಟ್ಟಿದೆ. ಕರಾವಳಿ, ಮಲೆನಾಡಿನ ವಾಣಿಜ್ಯ ಬೆಳೆ ಅಡಕೆಯಲ್ಲಿ ಈ ಬಾರಿ ಅರ್ಧದಷ್ಟು ಫಸಲೇ ಇಲ್ಲ. ಅಡಕೆ ಉತ್ಪಾದನಾ ಇತಿಹಾಸದಲ್ಲಿ ಇಂಥದ್ದೊಂದು ಕಂಟಕ ಇದೇ ಮೊದಲು.



ದಶಕಗಳ ಹಿಂದೆ ಕೊಳೆರೋಗ ಸೇರಿ ಹಲವು ರೋಗಗಳು ಕಾಣಿಸಿ ಫಸಲು ನಷ್ಟವಾಗಿತ್ತು. ಇಳುವರಿ ಇಲ್ಲದಂತೆ ಆಗಿರುವುದು ಇದೇ ಪ್ರಥಮ. ನೆರೆಯ ಕಾಸರಗೋಡಿಗೂ ಎಲೆಚುಕ್ಕಿ ರೋಗ ವಿಸ್ತರಿಸಿದೆ. ಎಲೆಚುಕ್ಕಿ ರೋಗ ಆಷ್ಟಾಗಿ ಕಾಣಿಸದ ಪುತ್ತೂರು, ಬಂಟ್ವಾಳಗಳಲ್ಲಿ ಉಷ್ಣಾಂಶ ಕಾರಣಕ್ಕೆ ಫಸಲು ಕೈಕೊಟ್ಟಿದೆ.

ಹವಾಮಾನ ವೈಪರೀತ್ಯ ಹಿನ್ನೆಲೆಯಲ್ಲಿ ಬೆಳೆಗಾರರಿಗೆ ಸೂಕ್ತ ಪರಿಹಾರ ನೀಡುವ ನಿಟ್ಟಿನಲ್ಲಿ ಹವಾಮಾನ ಆಧಾರಿತ ಬೆಳೆ ವಿಮೆ ಮಂಜೂರಾತಿ ಕೋರಿ ಕೇಂದ್ರ ಕೃಷಿ ಸಚಿವ ಶಿವರಾಜ್ ಸಿಂಗ್ ಚೌಹಾಣ್ ಅವರನ್ನು ಭೇಟಿ ಮಾಡಿ ಕೇಂದ್ರೀಯ ತೋಟಗಾರಿಕಾ ಬೆಳೆಗಳ ಸಂಶೋಧನಾ ಕೇಂದ್ರ(ಸಿಪಿಸಿಆರ್‌ಐ) ವತಿಯಿಂದ ಮನವಿ ಮಾಡಲಾಗಿದೆ.

• ಡಾ.ಕೆ.ಬಿ.ಹೆಬ್ಬಾರ್ ನಿರ್ದೇಶಕರು, ಸಿಪಿಸಿಆರ್‌ಐ ಕಾಸರಗೋಡು

ಶೇ.50ರಷ್ಟು ಫಸಲು ಇಲ್ಲ: ಕರಾವಳಿ ಸಹಿತ ಕಾಸರಗೋಡು ಜಿಲ್ಲೆಗಳಲ್ಲಿ ಶೇ.40ರಿಂದ 50ರಷ್ಟು ಅಡಕೆ ಫಸಲು ಈಗಲೇ ಇಲ್ಲ. ಕನಿಷ್ಠ ಮೂರು ಅಡಕೆ ಕೊಯ್ಲು ಇರುವಲ್ಲಿ ಈ ಬಾರಿ ಒಂದೇ ಕೊಯ್ಲಿಗೆ ಸೀಮಿತವಾಗಿದೆ. 6 ಕೊಯ್ಲು ಮಾಡುತ್ತಿದ್ದವರು ಮೂರಕ್ಕೆ ಸೀಮಿತಗೊಳ್ಳುವ ಆತಂಕದಲ್ಲಿದ್ದಾರೆ. ಕೆಲವೆಡೆ ಕೊಯ್ಲಿನ ಉಸಾರಿಯೇ ಬೇಡ ಎಂದು ಕೇವಲ ಬದ್ದ ಅಡಕೆಗೆ ಶರಣಾಗಿದ್ದಾರೆ.

Kannadaprabha pg 08

ಉಲಿಹಕ್ಕಿ

ತೋಟದ ಪೊದೆಗಳ ಮರೆಯಲ್ಲಿ ಕುಳಿತು ಕೂಗುವ ಹಕ್ಕಿಯೇ ಉಲಿಹಕ್ಕಿ. ಅದರ ನೀನಾದದಿಂದಾಗಿಯೇ ಅದಕ್ಕೆ ಆ ಹೆಸರು ಬಂದಿದೆ. ಆಶಿ



ಪ್ರಿನಿಯಾ ಎಂಬ ಆಂಗ್ಲ ಹೆಸರುಳ್ಳ ಈ ಹಕ್ಕಿಯ ವೈಜ್ಞಾನಿಕ ನಾಮಧೇಯ ಪ್ರಿನಿಯಾ ಸೊಸಿಯಾಲಿಸ್.

ಇದ್ದಕ್ಕಿದ್ದಂತೆ ನಮ್ಮ ಮನೆಯಂಗಳಕ್ಕೆ ಧಾವಿಸಿ ಕೆಲವು ಕ್ಷಣ ನೆಗೆದಾಡಿ, ಆನಂತರ ಥಟ್ಟನೇ ಕಾಲುಗಳನ್ನು ಕುಪ್ಪಳಿಸುತ್ತ ಸ್ವಲ್ಪ ಎತ್ತರದಲ್ಲಿ ಹಾರಿ ತದನಂತರ ಸಮೀಪದ ಗಿಡಗಂಟಿ, ಪೊದೆಯೊಳಗೆ ಸೇರಿ ಮಾಯವಾಗುವ ಈ ಹಕ್ಕಿಗಳು ಭಾರತದ ಜೌಗುಪ್ರದೇಶಗಳಲ್ಲಿ, ಪಾಕಿಸ್ತಾನ, ಶ್ರೀಲಂಕಾ, ಬಾಂಗ್ಲಾದೇಶದ ಹುಲ್ಲುಗಾವಲುಗಳಲ್ಲಿ ಮತ್ತು ತೋಟಗಳ ಸಮೀಪ ಒಂಟಿಯಾಗಿ ಇಲ್ಲವೇ ಜೋಡಿಯಾಗಿ ಕಾಣಿಸಿಗುತ್ತವೆ. ಹಿಮಾಲಯದಲ್ಲಿಯೂ ಸುಮಾರು 1500 ಮೀಟರುಗಳಷ್ಟು ಎತ್ತರದವರೆಗೂ ಇವು ಕಂಡುಬಂದ ಉದಾಹರಣೆಗಳಿವೆ. ಆಗಿಂದಾಗ್ಗೆ ತನ್ನ ಬಾಲವನ್ನು ಮೇಲಕ್ಕೆತ್ತಿ ಸದಾ ವಿಶ್ರಾಂತಿ ರಹಿತವಾಗಿ ಟುವ್ವಿ ಟುವ್ವಿ ಎಂದು ಕೂಗುತ್ತಿರುವ ಈ ಹಕ್ಕಿಗಳು ಕ್ರಿಮಿಕೀಟಗಳನ್ನು ಹಾಗೂ ಇನ್ನಿತರೆ ಸಣ್ಣಗಾತ್ರದ ಜೀವಿಗಳನ್ನು ಹಿಡಿದು ತಿನ್ನುತ್ತವೆ.

ಗುಬ್ಬಿಯಷ್ಟು ಗಾತ್ರವಿರುವ ಹೆಣ್ಣು ಮತ್ತು ಗಂಡು ಹಕ್ಕಿಗಳ ದೇಹ ರಚನೆಯಲ್ಲಿ ಯಾವುದೇ ವ್ಯತ್ಯಾಸ ಕಾಣುವುದಿಲ್ಲ. ಮೈಬಣ್ಣ ಬೂದು ಮಿಶ್ರಿತ ಸ್ಲೇಟ್ ಬಣ್ಣದಿಂದ ಕೂಡಿದ್ದರೆ, ಕೆಳಮೈ ಕಂದು ಮಿಶ್ರಿತ ಬಿಳಿ ಬಣ್ಣ ಹೊಂದಿರುತ್ತದೆ. ಸದಾಕಾಲ ಮೇಲೆದ್ದಿರುವಂತೆ ಕಾಣುವ ಬಾಲದ ತುದಿಗಳು ಕಂದು ಮತ್ತು ಬಿಳಿ ಪಟ್ಟಿಗಳನ್ನು ಹೊಂದಿರುತ್ತವೆ. ಚಳಿಗಾಲದ ಸಮಯದಲ್ಲಿ ಮೈಮೇಲಿನ ಸ್ಲೇಟ್ ಬಣ್ಣವು ಕುಂದಿದಂತಾಗಿ ಕಂದು ಬಣ್ಣವು ಎದ್ದು ಕಾಣುತ್ತಿರುತ್ತದೆ. ಟುವ್ವಿ ಹಕ್ಕಿಗಳ ಬಣ್ಣ ಹಾಗೂ ಗಾತ್ರದಲ್ಲಿನ ವ್ಯತ್ಯಾಸದ ಆದಾರದ ಮೇಲೆ ಇವುಗಳನ್ನು ನಾಲ್ಕು ಪ್ರಬೇಧಗಳನ್ನಾಗಿ ವರ್ಗೀಕರಿಸಲಾಗಿದೆ.

Viswavani pg 11

Hunsur lab to provide anti-venom boost for state

PAVAN KUMAR H
HUBBALLI, DHNS

India's first serpentarium focusing on research and snakebite management will open on Feb 10 in Hunsur, Mysuru district, giving a major shot in the arm for tackling deaths caused by venomous reptiles in Karnataka.

The advanced scientific lab at the unit is equipped to extract venom from at least seven species of highly venomous snakes for developing anti-venom that is usually in short supply in medical facilities.

And unlike other snake parks and venom extraction centres in India, the unit in Rathnapuri village will collect venom from a variety of captive snakes, which would be supplied to state-owned or private companies in the state for producing Karnataka-specific anti-venom.



Unlike other snake parks, Hunsur unit will collect venom from a variety of captive snakes

Making hiss-tory

- The venom would be supplied to state-owned/pvt companies in the state for producing Karnataka-specific anti-venom
- The lab has received permission to house approximately 400 snakes at the serpentarium

The lab will follow standards prescribed by the World Health Organisation for venom extraction.

Apart from collecting venom from the 'big four' — spectacled cobra, common krait, Russell's viper and saw-scaled viper — scientists are planning to collect venom from Malabar pit viper, hump-nosed pit viper and the world's longest venomous snake, the king cobra. The 'big four' are said to be behind a large number of human deaths in the country.

Gerard Martin, co-founder of the Liana Trust that is setting up the serpentarium, said that snake bites in rural areas are one of the major reasons for accidental deaths in India.

Dec Hrd pg 02

Pista: A nutrient-dense power house

A handful of pistachios is a wholesome, nutrient-rich and delicious snack any time of the day, says Clinical Dietitian **Jahnavi Bhograj**



Eat Right

Known as the 'skinny nut' by nutrition experts, pistachio is one of the lowest-calorie, lowest-fat nuts, offering a crunchy, satisfying snack without compromising on your health goals. With 49 kernels per 28 grams, pistachio gives you more nuts per serving than almond (23 nuts), walnut (14 halves) or cashew (18 nuts), making it a volume-friendly choice for mindful eaters. Just a handful of around 30 kernels (about 30 grams) packs only 100 calories, perfect for those looking to manage weight without sacrificing flavour.

Why choose pistachio?

Pistachio is a nutrient-dense powerhouse, rich in Vitamin B6, copper, manganese, protein, fibre, thiamine and phosphorus. It is also loaded with antioxidants including catechins, anthocyanins and isoflavones, which help reduce inflammation and combat oxidative stress.

Given its low glycaemic index, pistachio is an excellent snack for stabilising blood sugar, making it ideal for people managing diabetes.

How much should you eat?

A small handful of about 30-40 pistachios (30 grams) is the serving size. While pistachio can be pricier than other nuts, incorporating it in moderation or mixing it with options like peanuts balances both nutrition and cost.

When's the best time for pistachio?

Pistachio is versatile and fits seamlessly into your daily routine. Enjoy it as a mid-morning snack, a post-lunch pick-me-up, or a healthy alternative to namkeen during evening teatime. It also makes a great post-workout snack, providing protein and healthy fats to refuel your body. Pistachio is more than just a snack. It is a symbol of mindful eating and balance. Whether you are managing weight, controlling diabetes or simply seeking a nutrient-rich bite, pistachio is a delicious, wholesome option. Make it a part of your balanced diet and savour every bite on your journey to wellness.

Hung curd with sliced apples, pistachios and a sprinkle of cinnamon

For a local twist, swap Greek yogurt with thick hung curd. Mix in crisp apple slices, a handful of pistachios and a dash of cinnamon. This snack offers a perfect balance of protein, fibre and healthy fats to stabilise blood sugar while satisfying your sweet tooth. Alternatively, sprinkle chopped pistachios over Shrikhand or add them to fruit chaat for an extra crunch.

Dec Hrd Pg 08

Centre holds consultation with States on setting up biomanufacturing facilities

Jacob Koshy
NEW DELHI



The States made presentations on their efforts at promoting biotechnology industries.

Following the approval of the Biotechnology for Economy, Environment and Employment (BioE3) policy by the Union Cabinet last August, the Department of Biotechnology organised a consultation with States on Friday here to setting up biomanufacturing facilities in their regions.

Biomanufacturing refers to the industrial manufacture of a variety of products relating to high-value bio-based chemicals, biopolymers and enzymes; smart proteins and functional foods; precision biotherapeutics and climate resilient agriculture.

"Currently, several States do not even have a policy on biotechnology manufacturing. For the next, say Biocon, to emerge we need close engagement between States and the Centre," said Rajesh Gokhale, Secretary, Department of Biotechnology.

"I am confident that in the coming years, biotechnology will be an avenue of massive investments and profits, and (States) that take early steps will have an advantage," Union Science Minister Jitendra Singh said at the conclave.

The road map to achieving this will involve establishing 'State-centric BioE3 cells', formulating State-centric BioE3 action plans, constituting State-level steering committees, appropriate working groups and nodal officers and setting up Bio-AI hubs, foundries and manufacturing hubs.

Several States made presentations on their efforts at promoting biotechnology industries. However, they were largely unanimous that without significant support from the Centre, in terms of direction and fund, successfully scaling up biotechnology manufacturing would be challenging.

Hindu Pg 16