

# Latest technologies in Insect Pest Management



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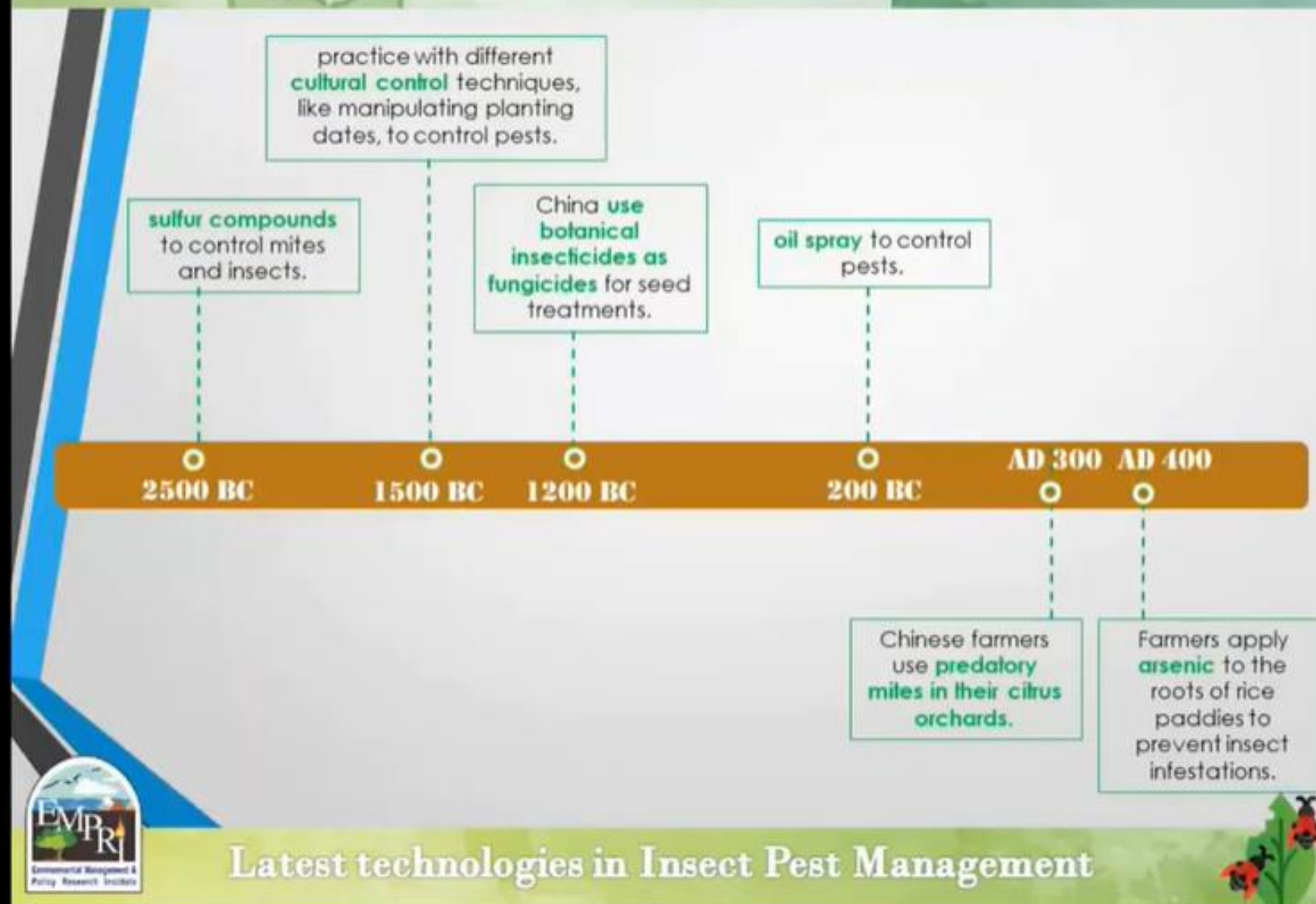
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## History



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## Health hazards of pesticide use in India

- 1 PESTICIDE POISONING:**  
India experiences a high number of acute pesticide poisoning cases, with an estimated **145 million cases and 10,000 deaths annually** due to unintentional exposure.
- 2 LONG-TERM HEALTH EFFECTS:**  
Exposure to pesticides, even at low levels can lead to **neurological damage, reproductive issues, cancer, birth defects, and immune system suppression**. Studies have linked pesticide exposure to increased risks of **Alzheimer's and Parkinson's diseases**.
- 3 VULNERABLE GROUPS:**  
**Children** are particularly vulnerable as early-life exposure can **affect their developing brains, nerves, and other bodily systems**, leading to developmental delays and other health problems. **Pregnant women** and their **fetuses** are also at risk, as **pesticides can cross the placenta and be transferred through breast milk**.
- 4 OCCUPATIONAL HAZARDS:**  
**Agricultural workers**, especially **pesticide sprayers**, face increased risks of pesticide poisoning, neurological damage and other health issues due to direct exposure.



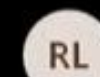
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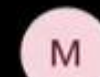
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### Examples of nanopesticides used in insect pest management

SL No.	Nanopesticides	Target insect	References
1	Silver nanoparticles	Callosobruchus maculatus (Fabricius) Trogoderma granarium Everts	Abid et al., 2020 Al-Naami et al., 2017
2	Eucalyptus oil nanoemulsion	Sitophilus oryzae (L.) and Tribolium castaneum (Herbst)	Adak et al., 2020
3	Nano-emamectin benzoate	Spodoptera littoralis (Boisduval)	Hassan et al., 2022
4	Silver and Zinc oxide Nanoparticles	Helicoverpa armigera	Asghar et al., 2022
5	Nanoemulsions of malathion, diazinon and chlorpyrifos-methyl	Spodoptera littoralis (Boisduval)	Badawy et al., 2022
6	Nanoemulsions of chlorpyrifos, malathion, cypermethrin, deltamethrin and lambda-cyhalothrin	-	Badawy et al., 2019
7	Nanoemulsion of neem oil	Sitophilus oryzae and Tribolium castaneum	Choupanian et al., 2017
8	Lambda-cyhalothrin solid nanodispersion	Plutella xylostella L.	Cui et al., 2015
9	Chlorantraniliprole solid nanodispersion	Plutella xylostella L.	Cui et al., 2016



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