



ICAR-HS-CCARI-Process-2024-062  
CCARI/Certified Technologies/2024-1

## DETECTION OF STEM AND ROOT BORER *NEOPLOCAEDERUS FERRUGINEUS* INFESTATION IN CASHEW

Lead Developer : **Dr.Maruthadurai R.**

Associate Developers : T. Veerakumar

### TECHNOLOGY DETAILS

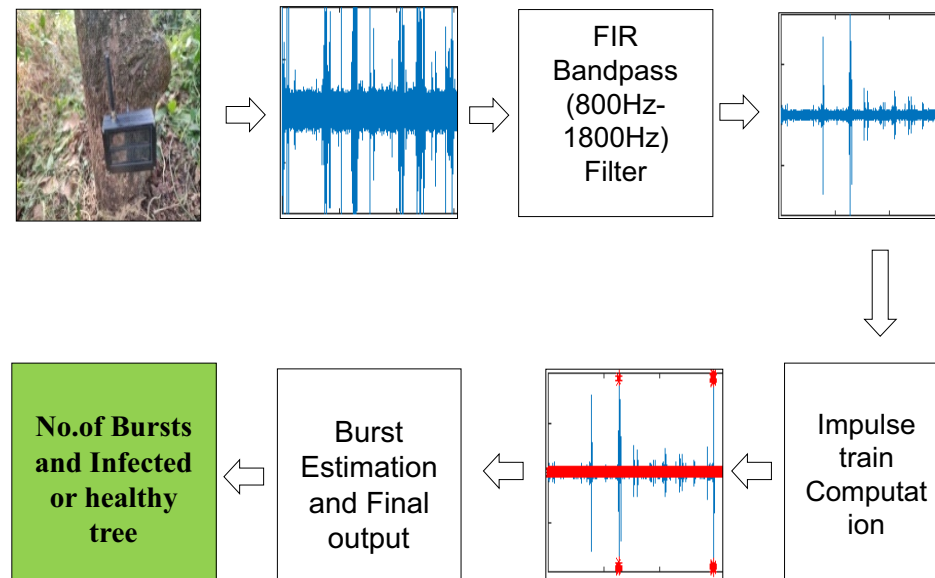
- Developed a **novel method and systems for the detection of stem and root borer** infestation in cashew, the first one from India and filed for **Indian patent (Provisional patent No: 202221006557)**.
- The proposed approach consists of four stages: in the first stage acoustic signal acquisition from the cashew tree by using acoustic sensor setup and the acquired acoustic signal is passed through the empirical mode decomposition to extract intrinsic mode functions (IMFs) in the second stage. The intrinsic mode features are computed from the IMFs in the third stage. Finally, the machine learning approach is used for the identification of whether the root borer exists or not from the intrinsic mode features.

### IMPACT

- Early detection enables to save the cashew trees around **70-75%** from stem borer damage.
- The developed methodology or algorithm could be tested or modified for early detection of other wood borers.

### PUBLICATION

- Maruthadurai. R, Veerakumar, T, Veershetty, C and Satish, A.N.C (2022) Acoustic detection of stem and root borer *Neoplocaederus ferrugineus* (Coleoptera: Cerambycidae) in cashew. *Journal of Asia Pacific Entomology*.25(3):101968. (NAAS Score: 7.58)
- A patent entitled “Method and systems for the detection of stem and root borer infestation in cashew” has been filed for Indian patent (Provisional patent No: 202221006557). The patent application was published on 11/8/2023.



Block diagram of the process



INDIAN COUNCIL OF AGRICULTURAL RESEARCH

Certified that

**R. Maruthadurai**  
(Lead Developer)

Associate Developer  
**T. Veerakumar**

of

**ICAR-CCARI, Goa**

has developed the technology

**Detection of stem and root borer  
*Neoplocaederus ferrugineus* infestation  
in cashew**

16th July, 2024  
New Delhi

(Vishaw Bandhu Patel)  
Assistant Director General (F&PC)

(Sanjay Kumar Singh)  
Deputy Director General (HS)