

Solar 24 X 7 Insect Trap:

A Greener Pest Management Device

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Biotic stresses cause 15-25 percent yield losses in India, amounting to 0.9 to 1.4 lakh crore rupees a year. The losses though cannot be eliminated altogether, these can be reduced. Sole reliance on the chemical pesticides has led to several side effects like resurgence of pests, resistance to pesticides and outbreak of secondary pests coupled with problems of environment pollution. The integrated plant health management (IPHM) encompasses cultural, mechanical, biological and need based chemical control measures. The proper monitoring of insect pests at the early stage of pest attack and control of those pests at early stage becomes most important. Recently, the light trap is becoming one of the essential tools in physical pest control and effective eco-friendly control. Insects can perceive and respond to light ranges in wavelength from 350 to 700 nm. Many of the insect species, mostly nocturnal are known to be positively phototrophic and are attracted towards artificial light in large numbers. Light Trap is one of the important IPHM tool usually used for monitoring insect populations, but also used for controlling pests. Attracting and killing one adult moth limits around 300-400 insect progenies. Light trap also helps in forecasting of pest outbreaks. Among several types of traps, light traps are commonly used in the field of agriculture.

Insects like phototrophic adult macro-lepidopteran: yellow stem borer, leaf folder, caseworm, boll worm, pod borer, semilooper, tobacco caterpillar, fall armyworm and white flies, aphids, bugs etc are attracted to yellow colours and thrips, leaf miner flies etc are attracted to blue sticky traps. As on date only one time usable Yellow/ Blue sticky traps are in use. These adhesive based traps can only effectively used for 8-10 days and then the plastic sheet used to make these traps goes waste. Due to shorter durability of the sticky traps, their usage is limited and acceptability among farmers is poor. The single use sticky traps are also not cost effective and were also left as unused garbage in the field/farm for long time causing pollution and blockage of irrigation channels in farm. Further accidentally devoured by some animal may cause intestinal problems.

Features

ICAR-National Rice Research Institute under Public-Private Partnership mode has developed an innovative Solar 24 x 7 Insect Trap

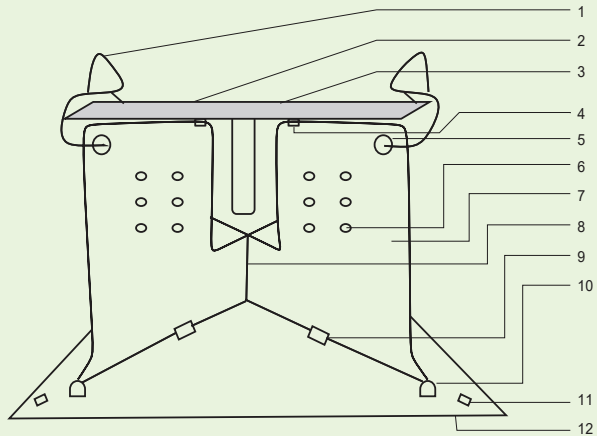
for monitoring and mass trapping of insect-pests of field, horticultural and plantation crops. Research study on development and use of the Solar 24x7 Insect Trap may be well adopted by the farmers due to its several field advantages and low-cost involvement.

The innovative Solar 24 x 7 Insect Trap is a combination of light and sticky trap has unique features due to which it is re-usable. This two-in-one trap works round the clock. In day time, insect pests will be attracted towards yellow/ blue colour where as in night hour, the flying insects will be attracted towards light source and get trapped in adhesive agent coated over trap.

The trap has three parts: head, baffles and base plate: Head is integrated with circuit, small battery/Solar Panel, etc, as required for trap operation. Baffles are in dual colours i.e, yellow and blue as per type of insect pests to be trapped in the target crops. Base plate is a grooved & rigid plate acting as a base of trap & for better gripping for hoppers. The trap is operated in solar energy, in addition, there is provision to charge the battery through electricity during cloudy weather. The trap is made up of reusable and recyclable plastic material. It is durable and the whole trap can be reused by the farmer, only adhesive is needed to be washed and re-coated as and when required.

Components of Solar 24 x 7 Insect Trap (1) Primary connecting joint (2) Solar panel (3) Light source (4) Baffles - Solar panel-connection joint (5) Hanging hole to fix solar panel (6) Holes for aeration (7) Adhesive coated baffles (8) Cross point of baffles (9) Guide point of baffles (10) Press fit knob of baffles forfixation of yellow trappingplate (11) Knob/guide for trapping plate (12) Yellow trapping base plate

Insect collection chamber near to light can easily be taken out from main trap body and the collected natural enemies escaped to the crop environment. This facility of escaping of non-target/natural enemies from the main insect collection chamber



is the unique feature of the innovative solar 24x7 insect trap. This is a desirable attribute for biointensive approach of pest management.

Specifications

The light source LED bulb with wave length ranges from 365 to 390nm, 80 A type solar panel, bale plate length: 11.5 to12.5 inch, width: 11.5 to 12.5 inch, beneficial insect segregation chamber hole size: 2-4 mm

- (i) *Day Night Trap 3*: Baffle height: 12 -14 inch; width: 7.5 to 8.5 inch
- (ii) *Day Night Trap 6*: Baffle height: 5-6 inch; width: 7.5 to 8.5 inch

Procedure for installation

- Install the light trap near or within the field where farmers want to trap the flying insects and keep the light source 60 cm above the crop canopy.
- Secure the poles
- firmly on the ground
- Mount the lamp or the bulb on the frame, five meters from the ground
- Daily morning collects the trapped insects and escape the beneficial insects to crop environment



Application

Day Night Trap 3 is recommended @ 3 traps per ha and Day Night Trap 6 @ 6 traps per ha for mass trapping whereas both the trap models are recommended @ 1 trap per ha for monitoring purpose in rice, maize, pigeon pea, chickpea, blackgram, greengram, mustard, mango, citrus, brinjal, tomato, cotton etc.

Benefits

- Non-target effect of chemical pesticides on beneficial insects can be overcome.
- Trap all the flying nymphs and adult insects like leaf folder, stem borer moths, fruit borer moths, hoppers, weevil and beetles etc., thereby reduce adult population and subsequent progenies in the fields.
- Collect insect pests and facilitate to identify the them for develop pest management plan.
- Portable across the crop area without any changes.
- Easy to operate and no special skills required for installation
- Eco-friendly, economical and helps reduction of chemical pest management cost.
- The non-target (beneficial) insects are segregated from harmful insects. With the help of this insect trap, use of chemical insecticide causing various environmental pollution and human and animal health hazards can be significantly reduced.

- The uniqueness of Solar 24X7 Insect Trap is that it works during rains too, when all other pesticide/insecticide gets washed off along with rain flow, it still attracts and traps harmful insects.
- The device is durable and can be used year after year as superior grade plastic are used.

Conclusion

The development of Solar 24 x 7 insect trap and successful demonstration of this tool in different crop areas in farmers fields, Krishi Vigyan Kendras showed as an alternate of chemical pesticide. This tool may



be considered as important for its eco-friendly nature and low-cost involvement to both the farmers and agricultural experts. The solar light trap model will be very much effective for the control of different insect pests of all crops such as rice, maize, pulse crops, vegetables, fruits, plantation crops with minimal use of chemical pesticides in the in near future. Many organizations may also utilize this useful IPHM tool for successful implementation of organic farming in the crop field for providing necessary safeguard to the nature. Hence, it is concluded that this is the best IPHM tool for control of major crop pests.



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NRRI Technology bulletin - 206, April-2024

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Editing: S D Mohapatra



Typesetting: ICAR-National Rice Research Institute, Cuttack-753006, Odisha
Published by: The Director, ICAR-National Rice Research Institute, Cuttack (Odisha) 753006
Printed at: Printtech Offset (P) Ltd., Bhubaneswar



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