

Climate Smart Villages

Case Study on Solar Light Traps

Background

Agriculture and Livestock is the main occupation of Anantapur people. Farmers encounter the problems of various types of insect pests that harm crops. This is resulting in loss of productivity greatly reducing the incomes each year. In order to control the crop damage and crop losses, farmers have started depending on the chemical pesticides to reduce the damage and protect the crop from harmful insect pests. Higher amounts of chemicals usage have developed resistance in the harmful insect pest. Applications of high amount of harmful pesticides leaves chemical residue in produce which is dangerous to the consumers affecting their health, animals, also effecting environment as well as ecology.

Insect and pest control is necessary for the farmers to solve the problem of crop damage. Other than use of chemicals, there are many preventions and exterminations for the pest problems such as natural, physical, use of resistant varieties and integrated pest management methods.



1. **Natural or Organic Farming:** The control of pest by using natural leaf decoctions and dung based pest repellents. In addition to killing the pests, these biological control products support in increasing count of the beneficial insects and enhance the soil micro organisms.
2. **Plant resistance:** Use of pest resistant crop varieties (improved varieties) to prevent the pest from feeding and breeding on the main crop.
3. **Mechanical and Physical methods:** This method controls the pest attack by using solar light traps, insect traps using sticky colour pads or lure pheromone net traps.
4. **Integrated pest management:** Using more than two methods for controlling the pest insect damage. Crop ration system, cultivation of border crops, incorporation of trap crops in the main field such as marigold crop as trap crop in a vegetable plot is used to reduce the incidence of insect – pest damage.

Out of the above listed various methods of insect pest controlling systems, “*Mechanical/ Physical method*” is considered to be environmental friendly and quick results are observed against the control of crop loss and damage.

Insect traps are used to attract and catch the harmful insects. Insects majorly damage the crop during dawn and dusk of a day. To control the pest damage, “*Insect Light trap*” is used to monitor and trap the nocturnal harmful insects/ pests (thrips; aphids; white fly; nymphs; leaf folder; adult insects such as stem borer moth; fruit fly; Rhinoceros beetles etc).

Climate Smart Villages Project

Following the growing awareness on the environmentally sound technologies and to prevent the use of chemical pesticides and insecticides to control the crop damage, **APMAS** with its funding partner **AEIN, Luxemburg** has implemented a project “**Climate Smart Villages (CSV)**” to introduce innovative climate resilient agriculture practices in order to promote affordable and replicable adaptation and mitigation practices to enhance livelihoods of vulnerable communities.

The project is being taken up in ten villages in five-gram panchayats of Nallamada and Gudibandla mandals, Ananthapur district with 5 important components such as ‘**Climate Smart Agriculture**’, ‘**Climate Smart Energy**’, ‘**Climate Smart Institutions**’, ‘**Climate Smart Nutrition**’ and ‘**Climate Smart Knowledge**’.

Under the component “**Climate Smart Energy**”, with a focus to reduce the use of harmful chemicals the project has introduced “**Solar Insect Light Traps**” for the optimum utilization of renewal energy in controlling the crop damage. This has contributed to reduce the dependency on chemicals and increased following organic farming practices by the farmers.



Promotion of Solar Light Trap

Solar Insect Light Trap is a renewable energy based device that supports farmer to reduce the usage of spraying chemical pesticides by capturing economically impacting insect pests in the fields.

The project staff has introduced this innovation through creating awareness by organizing Farmer Field Schools (FFS) and demonstrations on utilization of the equipment. Awareness was created to 200 farmers (nallamada – 80, GDB – 120) including 60 women farmers (30%).

The awareness programs and the demonstrations have encouraged farmers to adopt to this innovative idea. Farmers have come forward take up this activity in their fields.

Criteria of beneficiary selection:

- Small and marginal farmer (land having minimum 2.5 acres)
- Farmer interested to promote climate resilient practices
- Farmer attended Farmer Field Schools (FFS)
- Priority to “Demo Farmer”

Procedure

One solar insect light trap is installed in half acre to trap the insects. The equipment is fixed to a light sensor stand, portable and there is no additional operating mechanism needed to be followed by the farmer. Cost of investment is reduced by 50% as there are zero costs involved on chemical pesticides.

Adopting this technique will reduce the harmful insect population while enhancing the beneficial insects (honey bees, butterfly, and lady bird beetles) in turn increased yield by 15% as well as enhancing the quality of yield. Income increase is observed by 20%. As the equipment is operated by renewable energy (solar power) there are no additional investment or maintenance costs involved. In addition to this, reduced chemical usage had promoted beneficial micro organisms, and improved organic matter in the soil.

Through project we were able to reach to 85 small and marginal farmers including 60% women through distribution of 140 units. On an average each farmer has installed two solar insect traps for

one acre land mostly for horticultural (fruits and vegetable crops) and agricultural crops (Groundnut).



Cost of each trap is Rs. 2700/- (invested on each farmer). Based on the results the farmers are interested to install more traps in their plots on their own and neighbouring farmers are interested to adopt the activity.

The Farmer Field Schools has enhanced knowledge to the farmers in differentiating beneficial and harmful insects of the crops.

Farmer feedback:

Ms. Sharadamma, cc qiri from Gudibanda mandal. Agriculture is the major livelihood of my family. We have 5 acres of land under guava and tamarind plantation. Guava fruit fly, fruit borer, sucking pest, tea mosquitoes bug are the four major pests damaged my crop by 60% in the year 2019 and 2020. It's a common practice to use various chemical pesticides to control/kill the crop damaging pests. I have invested on chemical pesticides to



control the crop damage but I have observed that these chemicals have lead to heavy crop investment (Rs.1,00,000/-). As I expected 30 tonnes of yield, I was about to harvest on 10 tonnes due to insect damage. My returns were only fifty thousand rupees, was left in losses.

I have attended the awareness programs organized by the CSV team on natural way of plant protection measures and were encouraged to adopt the Solar Insect Light Trap. I have benefitted with 2 solar insect traps in Nov 2021. I have installed solar light traps in my 4 years old guava plantation (having 2000 trees). The crop damage is reduced by 80% immediately after installing the solar insect trap. I was able to harvest 40 tonnes of guava fruits this year. The quality of the fruits was also increased as there is high price for my produce in the market. This resulted in increased income by 10%.

My field now has become a model demonstration plot. 30 Farmers from Karnataka have visited my plot to understand the technology. I have also trained 50 neighbouring farmers in my village encouraged them to install these traps for a sustainable crop protection.

I am T. Vijayamma, from pathabathalapalli village, Nallamada Mandal. I am a small holder farmer having 1 acres land (0.4 hectare) growing vegetables (tomato, chilli, brinjal, bhendi) throughout the year. I faced crop losses by attack of sucking pest, fruit borer, and virus transmitting insects. I have invested on chemicals to control the crop damage but not really successful in controlling the losses. My crop investments have increased but my returns did not even meet labour charges. Use of chemical pesticides not only increased my cost of cultivation but also affected my health lead to breathing issues.



I have attended Farmer Field Schools at the demonstration plots organized by the CSV project staff in Nov 2021. I liked the idea and adopted the technical of using solar light trap. I have received 1 trap for 1 acre of my vegetable plot at half price. This is a simple portable device which does not need any technical/ manual resources. After installing this device, I observed all the crop damaging insects were attracted to the light fell into the water. This has tremendously reduced the insect attack on the crop also reduced the investment cost on chemicals. Time spent on insect control measures is reduced by 60%. Now I am able to spend extra time on other field operations. My fruit losses are reduced by 60%. I am planning to buy 2 more light traps in my other plot for cultivation of groundnut, pluses and more vegetables.