

DEVICE THE TRAP FOR INSECTS OF WRECKERS WORKING FOR
AUTONOMOUS ENERGY

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ANNOTATION:

The general concepts about construction and the principle of work the trap executed by authors of this article and tested in real objects the device for insects of wreckers working for autonomous energy are given in article.

Keywords: modern elements, agriculture, intelligent sensors, pheromone, butterfly, egg, illumination, autonomous, power system, cotton, corn, fruit, vegetables.

Introduction. Currently, the development of any industry involves the use of new types of modern elements. In agriculture it involves the use of new types of chemicals, selection methods and genetic engineering. In production and industry, the use of software packages, smart sensors, the use of industrial robots and energy saving elements.

This article provides concepts about the construction and operating principle of a trap device, developed and laboratory tested by the authors for insect pests, powered by an autonomous energy source.

Methods. In providing agricultural products to the population and industrial enterprises, one of the main tasks today is plant protection. Of the world's total harvest, at least 30% is lost as a result of damage from insects and harmful plants. As a result of the successful development of the chemical industry, new types of chemicals (pesticides) against pests are being developed and produced. Along with the effectiveness of quick, convenient interaction and use, chemicals can cause serious harm to animals and nature as a whole. In connection with this, for many years, combined methods of protecting agricultural plants from pests have been widely used throughout the world. In this method, it is advisable to use chemicals only in the necessary conditions, and in other cases it is safe and cheaper to use beneficial insects. For this purpose, pheromone traps are used to determine the flight period of flying harmful insects. Pheromone is a Greek word and means "pheron" - from afar, "mone" - I excite, motivate.

Pheromones are special substances secreted by the female. They inform the males that she is ready to breed. Thus, only males are caught in the trap. And without the "strong half" of the population, procreation becomes impossible. Male butterflies are very sensitive to this drug, and can find females within 200 meters to 9 km. Based on these considerations, pheromone traps are widely used in agriculture. In pheromone traps, male butterflies flying to female butterflies stick to entomological glue and die, but delaying mating increases the lifespan of females and the time they are ready to reproduce. This negative consequence is compensated by a decrease in butterfly fertility and egg viability.

To accurately determine control measures and collect butterflies before fertilization, the following are used: 1 Use of pheromone traps. 2. Use of lamps around the cotton field. 3. Filling plastic vessels with WHYS solution (water, honey, yeast, sugar). Based on the biological characteristics of butterfly pest cocoons, a new pest trap device was developed and implemented.

When developing the device, the peculiarities of male butterflies finding females were taken into account.

The proposed device simultaneously attracts insect pests in 3 ways:

1. Artificial lighting at night.
2. Pheromone trap capsule.
3. WHYS solution.

The WHYS solution is prepared as follows: 3 liters of water are brought to a boil and cooled until warm, 250 grams of sugar, 50 grams of honey, 2 grams of yeast are added and stirred. The prepared solution is poured into the vessel of the device. Females and males of butterflies fly in from the smell emanating from their WHYS and when they fall into the solution they die.



Figure 1. Insect pest collection device

Simple and solar-powered devices have been developed. A simple type is connected to a 220 V network. The device, powered by solar panels, is used in places where there is no voltage in centralized electrical networks. The operation of the device is controlled automatically, is mobile, can be easily transferred from one field to another and can be used for several ten years.

Mobile uninterruptible power supplies consists of the following main blocks:

- inverter unit of a certain output power;
- deep-discharge and high-capacity battery pack;
- relay for switching with the network (can be built into the inverter);
- a charger of a certain current level (the charger can be built into the inverter)

In such a systematic energy device, the operation of the maximum loaded energy device at night is 3-3.5 hours.

Several years of tests have shown that if the battery is properly connected to the device, the mains voltage is not allowed to be connected to the inverter output, and the load of suitable power is connected, the autonomous power supply has a continuous working environment and does not require additional maintenance. the battery is automatically disconnected from the battery charging circuit when the battery is fully saturated, and is connected to the charger again when the voltage decreases. The test results showed the following:

1. When using a 40 A/h battery as the primary energy source, an autonomous supply source with a power of 50-100 W will keep the device in working condition for 4.5-5 hours.

2. During 6-7 hours of 50 W solar battery on an outdoor day, the battery recovers the energy used by the battery (60÷70 %).

3. In the conditions of operation of the device, the power of the solar battery is correctly selected, which ensures the mobility of the device.

Results. This tested mobile uninterruptible power supply can be used for high-quality power supply of telecommunication communication, radio stations, medical systems, household radio-electronic equipment, as well as control systems of complex technical objects, with the appropriate selection of AB capacity, solar battery and inverter power.

Pest control equipment is recommended for cotton, corn, fruit and vegetable farms for plant protection. At the same time, the proposed new equipment catches butterflies in large quantities and does not lose them. In order to protect nature and preserve biological diversity, it is recommended to use the equipment every day until 20-23. An economical lamp that attracts less beneficial insects was chosen. During the use of the equipment, the head of the farm is responsible for the quality of the special capsule, its replacement every 10 days, the supply of light at night, and the timely pouring of the WHYS solution. According to our observations, when organizing the fight against the first generation of the bollworm, the equipment should be placed in wheat fields, because seed wheat is often planted between cotton rows. In this case, cotton pests develop in favorable conditions. The equipment should be placed in the cotton field to catch the second and third generation butterflies. During this period, the bollworm butterfly lays eggs on the cotton. After the cotton is opened, it is recommended to move the equipment to the corn field planted for grain. This event is an important event in the fight against the last - fourth generation of the bollworm butterfly. The organization of work against the last generation of butterflies is important in reducing the number of pests in the coming year.

Results and discussions. In conclusion, in the fight against harmful insects with the help of such a device, the used chemical preparations, equipment, fuel costs, bio-laboratory products are relatively saved, and manual labor is also reduced. An ecologically clean product is obtained. It is also planned to try harvesting the melon fly, for which control measures have not yet been established. In the following years, it is recommended to use this equipment due to the increased resistance of agricultural crops to the damage of various pests and the use of toxic drugs.

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