An applicator for filling granular insecticides into the leaf axils of Arecanut Palms

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ARECANUT palm (*Areca catechu* L.) is a major plantation crop of India grown mainly in the States of Karnataka, Kerala, Tamil Nadu, Assam and West Bengal. It is a single stemmed plant growing even upto a height of 25 m with slender stem and a crown of 2.5 m long with slippery leaf sheath. (Fig. 1). Influorescence is produced on the top of the stem below the crown.

The arecanut spindle bug (*Carvalhoia arecae* Millar China, Miridae: Hemiptera) is a major pest of arecanut palm in Kerala, Southern parts of Karnataka and certain parts of Tamil Nadu. The damage caused by this pest is very serious and it is a menace to the areca plantations. Colonies of this pest consisting of both adults and nymphs are seen in the innermost two leaf axils around the newly emerging spindle. They suck up sap from the soft spindle. The loss due to this pest incidence is about 25 per cent.

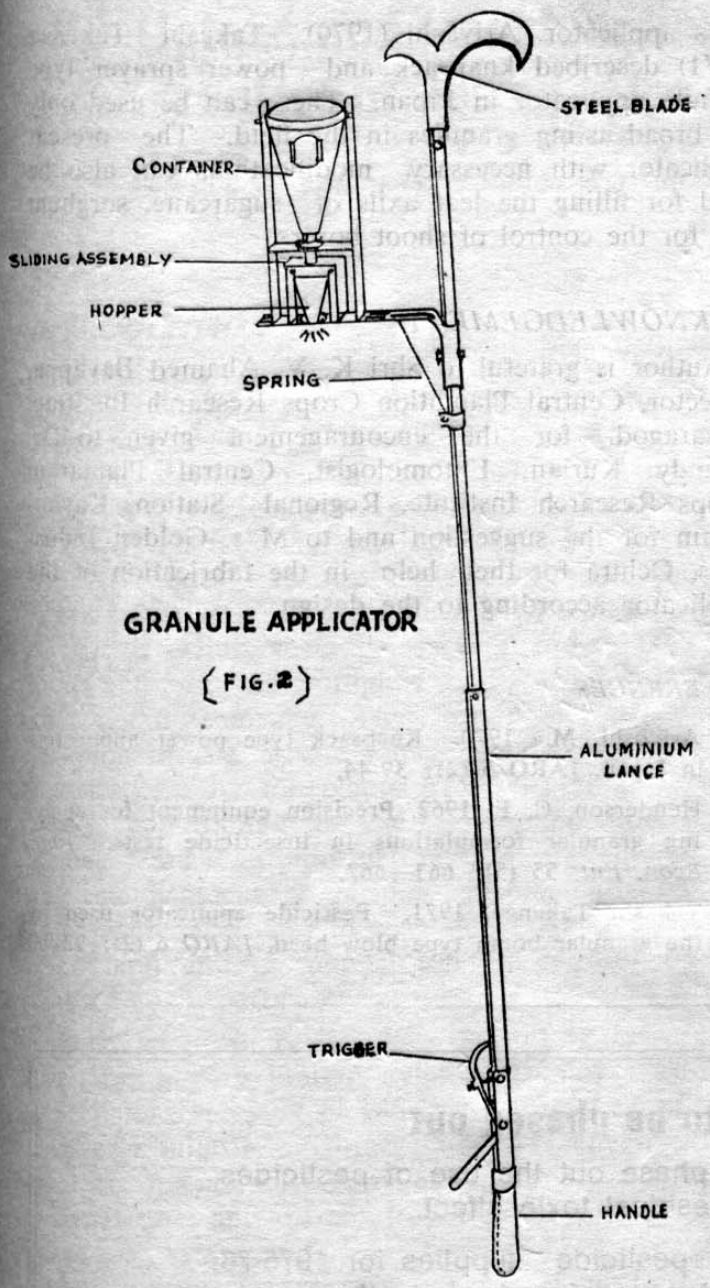
Fig. 1. Arecanut plantation

The earlier recommendations of spraying Endrin 0.2 per cent at monthly intervals proved to be unsatisfactory because of the intermittent rains prevailing in these areas. Hence a preliminary trial using granular insecticides was carried out. The insecticide granules were filled in the innermost two leaf axils of the palm. This trial gave encouraging results and the method was found to be very effective in controlling the pest. Based on this observation a large scale field experiment was laid out and there was good control of the pest in the treated plots (unpublished).

The great difficulty in climbing over the crown region of the palm necessitated devising of an instrument which could be conveniently used by the farmers to implement the recommendations of filling the leaf axils with granular insecticides. Hence the author designed and got fabricated an applicator and tested it for its utility. Details of the applicator is furnished here.

Figure 2 shows the diagram of the applicator. It consists of a hollow aluminium lance of 295 cm long with double edged steel blade at the top, a trigger unit and wooden handle at the bottom. A container, feeding hopper, and sliding assembly unit are fixed 21 cm below the top of the lance. The Container is conical in shape with an aperture on one side through which the insecticide is filled and this aperture can be closed with a lid. The container has a capacity of 200 cm^3. The conical bottom of the container is fixed on a supporting frame and the outlet aperture in the bottom is open. Hopper is a semi conical chamber with one inlet and one outlet aperture in the top and bottom respectively. Its capacity is 20 cm^3. This is the quantity of insecticide required to fill one leaf axil of the palm.

The hoppe is fixed on the lower plate of the supporting assembly. The outlet of container coincides with the inlet of the hopper so that the insecticide in the former can fall to the latter if they are not separated by a plate. The sliding assembly is fixed on the lower plate of supporting assembly. Sliding assembly consists of a slide with a hole and two vertical stands. These stands hold a plate plying in between the container and hopper in a horizontal position. There is a hole in this plate also. A spring holds the sliding assembly in such a way that in the normal position



GRANULE APPLICATOR

(FIG. 2)

hole on the plate will be in alignment with the outlet of the container and inlet of hopper, so that the insecticide filled in the container will pass into the hopper. There is another horizontal plate on the lower side of the sliding assembly unit. This plate has a hole which will be away from the outlet of the hopper in normal position so that the insecticide filled in the hopper cannot fall out. The string attached to the sliding assembly passes through the hollow lance and is connected to the trigger. When the trigger is pressed the string will pull the sliding assembly towards the lance and hole on the lower plate of the assembly will come in alignment with the outlet of the hopper permitting the insecticide in the hopper to fall out. At the same time the plate plying in between the container and hopper is also moved so that the hole on that plate is away from the outlet of container A and the outlet is closed so that the passage of insecticide from A is arrested when outlet of hopper is opened. So excess insecticide will not pass out from the container. When the trigger is released the sliding assembly will return to its original position by the pushing of the spring and this will help the passing of insecticide from the container to the hopper and outlet of the hopper is closed.

Field operation

Insecticide granules are filled in through the inlet aperture on the top of the container and it is then closed to prevent spillage of the granules. As the outlet of container and inlet of the hopper are connected with the hole on the sliding plate the insecticide wil pass into the hopper also.

A climber with some experience can operate this applicator very easily. He should climb over the stem and take position just below the bunch (Fig. 3) and then can lift the filled applicator by the help of a string or coir rope. The total weight of the applicator is 1.4 kg. only.

Figure 3

In certain palms a few leaflets come in the way of the person operating this instrument in locating the exact position of leaf axil because of the overlapping arrangement of leaflets. Such leaflets can be removed by the help of the steel knife provided at the top end of the lance. After locating the leaf axil the instrument can be positioned in such a way that the hopper is exactly above the axil so that the granules in the hopper fall into it when the trigger is pressed by hand. After filling one leaf axil the trigger is released and the instrument is positioned on the next leaf axil and the process is continued. Then by the help of a string the instrument is brought to the ground. One leaf axil will be filled up with 20 cm^3 of insecticide and the volume of hopper is 200 cm^3. Five palms can be (10 leaf axils) treated by filling the hopper once. Efficiency of this instrument was tested on 150 palms and was found to be very useful and handy. The cultivators can make use of this without any modification. An applicator costs approximately Rs. 125/- only.

Henderson (1962) devised a precision equipment for applying granule formulations of insecticides in the leaf axils of Sorghum, corn etc. This is electrically operated by a 6 volt dry cell. One battery will only operate for one hour. This cannot be used for insecticide application on a large scale. Moreover the present applicator is entirely different from Henderson's applicator. Ariyashi (1970). Takashi Takenga (1971) described knapsack and power sprayer type granule applicator in Japan. These can be used only for broadcasting granules in the field. The present applicator with necessary modifications can also be used for filling the leaf axils of sugarcane, sorghum etc. for the control of shoot borers.

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REFERENCES

1. Ariyoshi, M. 1970. Knapsack type power applicators in Japan. JARQ 5 (2): 39-44.
2. Henderson, C. F. 1962. Precision equipment for applying granular formulations in insecticide tests. *Jour. Econ. Ent.* 55 (5): 663—667.
3. Takashi Takenga, 1971. Pesticide applicator used by the granular boom type blow head. *JARQ* 6 (2): 92-96.

Use of two pesticides to be phased out

THE Union Government has decided to phase out the use of pesticides, endrin and parathion, because of their residual toxic effect.

In working out of the programme for pesticide supplies for 1975-76, provision has been made for only 500 tonnes of endrin. In the current year provision has been made for import of 960 tonnes of endrin, against which the STC has concluded contracts for nearly 700 tonnes.

Talking to pressmen after the annual plant protection conference held in New Delhi recently, Miss Anna George, Joint Secretary in the Ministry of Agriculture, said it was proposed to eliminate the use of endrin and parathion completely.

But the state governments had said that till such time farmers were educated on the use of substitutes and sufficient quantities of substitute pesticides were made, available, the use of these should be continued. In view of this, it was proposed to cut down on their use in stages. As regards parathion, already one of the units producing ethyl parathion has stopped manufacture.

The demand for pesticides for 1975-76 as worked out by the conference was 63,000 tonnes. This figure was arrived at after discussing the estimate made by the Pesticides Association of India which worked out to 68,000 tonnes. The assessed demand for the current year was 56,000 tonnes.