A SCREW TYPE TREE INJECTOR

Thomas Joseph and T. S. S. Rawther

Scientists, Central Plantation Crops Research Institute, Regional Station, Kayangulam, Krishnapuram, Pin - 690 533, Kerala, India

Need to fabricate a suitable injector for use on coconut palm is obvious. Four types of injection methods/devices viz. Gravity feeding, Mauget injector, Air pressure injection and Minute tree injector have been developed for introducing chemicals into the stem (McCoy, 1974). The gravity feed injection method although simple, does not guarantee successful absorption. Only a limited uptake occurs making it difficult to have a desired quantity introduced by this method. The Mauget injector devised in U S A is not available indigenously. The fluid tank of the Air pressure injection device, has to be filled frequently with compressed air, which limits easy and expedient operation. The Minute tree injector, in the experience of the authors, does not operate when hard tissues like that of coconut are involved. This situation necessitated the fabrication of the injector reported here.

1. Description of the Injector

The Screw Type Tree Injector (Fig. 1.) has a barrel of 125 ml capacity with a built-in funnel for introducing the fluid. An air-hole provided behind the funnel facilitates exist of displaced air from the barrel. Fixed on a screw cap, the probe of the injector is 15 cm in length and tapers towards the free end. Its basal portion is threaded and 10 cm in length and 4.25 cm in circumference. The threading helps to have fast and tight hold on the stem making the assembly leaf - proof during operation. The distal portion of the probe, 5 cm in length and 3 cm in circumference, bears a single exist hole terminally and 9 holes laterally. In the event of the terminal hole getting clogged by intervening fibrous tissues, the outflow would continue unhindered through the lateral holes. Screwed on to the opposite end of the barrel, is the piston holder. Its threaded centralhole holds the screw lever. The piston is loosely fixed at the end of the lever inside the barrel in order to minimise wear and tear. A built-in piston handle at the other end of the lever ensures movement of the piston back and forth, on rotation. In order to make the whole assembly air-tight, during operation, a polythene ring is fixed around the piston in the middle and a rubber washer inside the screw cap.

The injector is operated through a pre-drilled hole on the stem, whose diameter approximately equals the circumference of the distal portion of the probe. The probe is introduced fully into the hole first by pushing and then by rotating the equipment holding fast on the knobs of the screw cap. At the end, the funnel should face upwards. By rotating the piston handle anticlockwise, the piston is brought back fully and the fluid poured into the barrel through the funnel. Clockwise rotation of the handle moves the piston forward driving the fluid into the stem. The injector exerts 50 psi pressure when operated.

125 ml fluid could be administered within 2 minutes.

II. Tests

Ten palms each in the age groups 10-15, 20-30 and 35-50 years were successfully tested for the efficacy of the injector. McCoy (1976) could detect Oxytetracycline as high as 20 ug/g fresh weight in the foliage within two days of trunk injection of 6g of antibiotic. Hence the uptake and translocation of the chemical were not monitored here.

III. Conclusion

The comparatively low pressure developed by the Screw Type Tree Injector enhances its effectiveness as it inflicts the least damage to the system of the plant. The pressure involved in the case of the other types of injectors ranges from 100 to 150 psi (McCoy, 1974a; Raychaudhury and Rishi 1981). Also the injector operates without leak. The pressurised trunk injection system of platic "T"s fabricated by Nair and Kunzru (seen in Nair, 1981) for use on Elm. has a low pressure of 20-30 psi and is leakproof; but it inflicts multiple injuries all round the trunk, which is not desirable on coconut. Made of steel, the present injector resists breaking on account of the pressure developed inside. The duration of 30 seconds to two minutes required for the application of concentrates was the shortest on record (Raychaudhuri and Rishi, 1981). However, application of dilute solutions is always preferred to the concentrates for which the present equipment is suitable. Chances of degradation through contact with metallic surface of air are avoided by the quick administration. Further, instances are on record (Raychaudhuri and Rishi, 1981) that the injected fluid did not degrade as it passed through copper or aluminium tubes for periods up to 24 hrs. Recent implication of MLO in coconut root (wilt) syndrome (Solomn *et al.* 1983) warrants injection of tetracyclines into the stem for which the present injector could effectively be made use of. The situation holds good for treatment of red weevil *(Rhynchophorus ferrugineus)* infestation on coconut as well.

Acknowledgement

The authors are thankful to Dr. K.V. Ahamed Bavappa, Director, Central Plantation Crops Research Institute, Kasaragod, and Dr. N. P. Jayasankar, Joint Director, CPCRI Regional Station, Kayangulam, for the keen interest they have shown in the work and for providing necessary facilities.

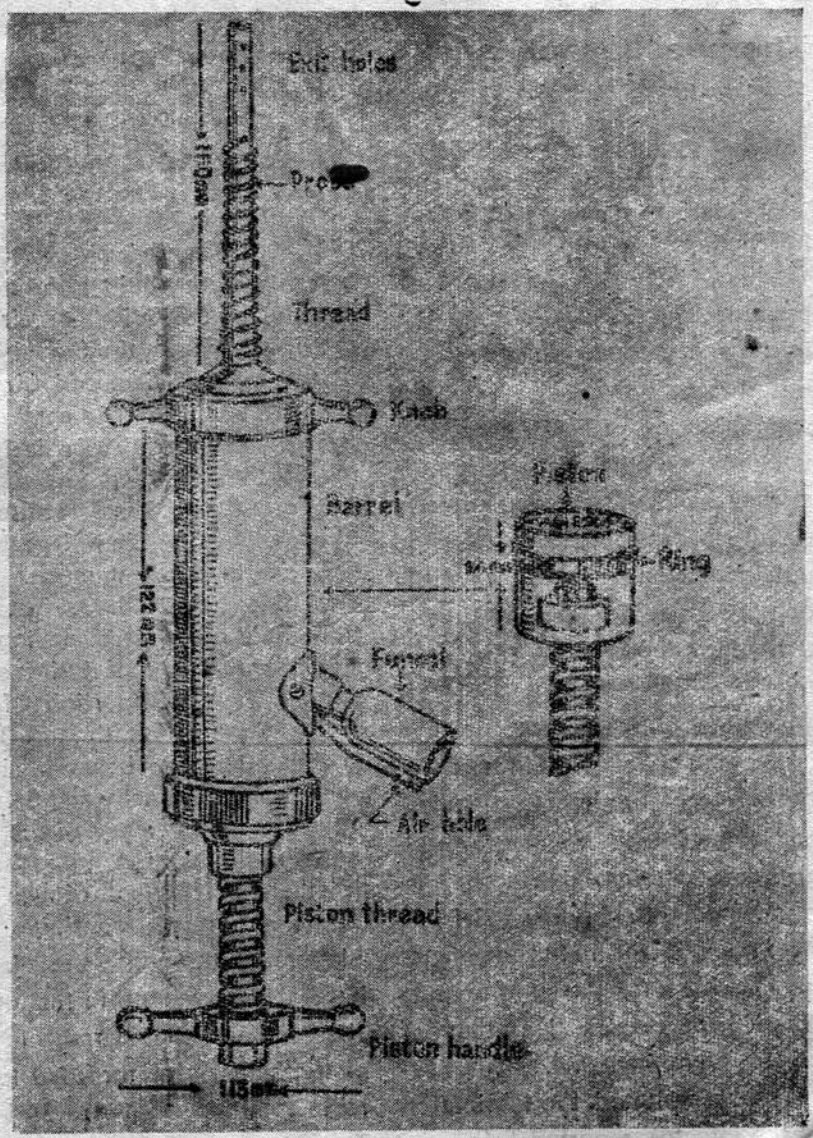

Fig. 1

References

McCoy, R.E. (1974). Techniques for treatment of palm trees with antibiotics. *Proceedings of the Florida State Horticultural Society*, Miami 87:537-40.

MCCoy, R.E. (1974. a) . *How to treat your palm with antibiotic.* Florida Agricultural Experimenta Stations. Institute of Food and Agricultural Sciences, University of Florida, Gainesville, Circular S-228 : 7pp.

Nair, V.M.G. (1981). *Control of tree diseases by chemotherapy. Mycoplasma Diseases of Trees ond Shrubs.* Academic Press, New York. Edited by Maramorosch, K. and Raychaudhuri, S.P. 362 pp.

Raychaudhuri, S.P. and Rishi, N. (1981). *Chemotherapy of mycoplasma diseases. Mycoplasmaf diseases of Trees and Shrubs.* Academic Press, New York. Edited by Maramorosch, K. and Raychaudhuri, S.P. 362 pp.

Solomon, JJ; Govindankutty, MP and Neinhaus, F. 1983. Association of mycoplasma - like organisms with the coconut Root (wilt) disease in India. *Z. Pflanzenkr Pflanzenschutz.* 90 (3), 295-297