

A NOTE ON A SURVEY OF COMMERCIALY AVAILABLE HOT WATER TREATMENT TANKS FOR THE CONTROL OF RATOON STUNTING DISEASE (RSD)

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Abstract

A series of tests was carried out on commercially available hot water treatment tanks used in the control of ratoon stunting disease (RSD). The method of testing is described and comment passed on various features of the six treatment plants covered in the survey. None of the plants could be faulted on any major point of construction or operation, and the general standard of operational control at the various sites visited during the survey was found to be satisfactory.

Introduction

In order to control the ratoon stunting virus in seedcane effectively by hot water treatment it is essential that the temperature of the water in all parts of the tank be maintained very closely to the recommended level of 50.5°C for the stipulated two hours.

The methods of heating, temperature control and circulation of water are important factors in the design of any hot-water treatment plant, while effective insulation of the tank against heat loss, and protection against corrosion inside the tank, pump and pipes are important factors in the economic operation of any plant.

It goes without saying that operational simplicity and accurate visual temperature recording instruments are important factors in effective plant management.

The survey

The main objective in the series of tests on commercial heat treatment plants was to consider and evaluate all aspects of the treatment process in the various types of plant. Of prime concern was the degree of temperature consistency within the tank during the two-hour treatment period.

A portable temperature recorder with a movable probe was employed in the tests. In addition a thermohygrograph was set up in the immediate vicinity of the plant to check whether atmospheric temperature and humidity were having any effect on the treatment procedure.

The temperature recorder was installed and the probe moved to four different positions in the body of water during the test.

Recordings were made for the full two-hour test period for each position of the probe.

The treatment plants tested during the course of the survey were the following:-

1. the Rossdee (capacity 275 kg seedcane) — electrical elements.
2. the Upfold (capacity 800 kg seedcane) — gas heater (outside the tank).
3. the Pieter Duys (capacity 2 tons seedcane) — single gas burner (incorporated in the tank)
4. the 2-D Engineering (capacity 400 kg seedcane) electrical elements.
5. the Donnellan and Perry (capacity 1 metric ton seedcane) — double gas burner (incorporated in the tank)
6. the Donnellan and Perry (capacity 500 kg seedcane) — single gas burner (incorporated in the tank).

Apart from investigating the temperature control qualities of the various treatment plants information was also gathered concerning such aspects as the following:-

- i quality of workmanship
- ii standard of insulation
- iii water circulation rate
- iv details of treatment procedure
- v operating conditions

Five of the plants tested had treatment tanks constructed of mild steel plate attached to an angle-iron frame. This plate formed the inner skin of the tank which in each case was coated with an epoxy compound anti-corrosive paint. To the outer face of the framework was attached galvanized sheeting, the cavity between the inner and outer shells being filled with fibre insulation.

In the sixth plant the basic tank was constructed of glass-fibre mounted on a wooden base frame.

The type, standard and positioning of insulation materials varied considerably but this had no obvious effect on their relative efficiencies.

All tanks tested were fitted with tight-fitting lids, some being insulated in the same way as the sides, but certain plants lacked insulation between the bottom of the tank and the floor.

All circulation systems worked very well and the actual circulation rates were well up to specification. This factor is important in assessing the standard of temperature control in the various plants which in all cases was found to be very good.

Because of the varied capacities, there was some variation in the time taken for the water to regain the required temperature after loading but having reached the desired level, all tanks maintained temperatures very well for the full two-hour treatment period.

In some tanks there was some evidence of slight overheating near the heat source but this was considered unlikely to affect the efficiency of the whole operation. In no instance could any of the heat treatment plants tested be faulted on any major point of construction or operation. Furthermore the general standard of operational control at the various sites visited during the survey was found to be very satisfactory. In these

six heat treatment plants we have a range of capacity and price to suit most canegrowers' requirements for seed-cane treatment. With due attention to operational efficiency and proper maintenance all six should provide effective control of RSD.

Thanks are due to the manufacturers and operators of the various plants for their co-operation in this survey.