COMPUTER AIDED TEMPERATURE CONTROLLER FOR A BROODER

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ABSTRACT

Temperature control in a brooder has been done mostly using a thermostat as the main controlling element. The use of the thermostat has been witnessed in industries where temperatures are very high. This has been done with the use of micro-controller. These systems are complex and require expertise to man. This thesis describes the design, test and development procedures of a Computer Aided Temperature controller for a brooder. The sensor was designed using temperature IC RS3911 and discrete components. The application software development was done using C language. C has facilities for writing well-structured programs for all low- level operation to be performed when necessary. The development of the controller involved two phases: the sensor design and application software design. Each part of the system was developed and tested separately to ascertain that it was working well before connecting the entire circuit together.

This controller was expected to control the temperature of a brooder. Initially, the temperature of the brooder is expected to remain constant at 35^0C for one week and subsequently decreased by 3^0C every week till temperature of 23^0C is attained. The controller was hooked to the computer and its performance was monitored for one week and it was found to be working quite well.

ABSTRACT

Premature failure of timbers in service due to deterioration by termites is a major cause of wood wastage in Kenya. Increasing the durability of timber by effective preservative treatments will contribute to better wood utilization and conserve timber that could have gone into replacing failed structures due to deterioration.

Effectiveness of copper chrome arsenate (CCA), creosote and pentachlorophenol (PCP) wood preservatives in *Eucalyptus saligna, Pinus patula* and *Cupressus lusitanica* against subterranean termite attack was studied. Clear sapwood from the three species were treated with the preservatives to low and high loadings and then exposed to subterranean termite attack at Cheptebo in Kerio valley, Kenya, using underground block and pencil test methods.

The untreated samples were severely attacked right from the first month and by the sixth month they had been completely degraded. At low loading, the three preservatives were significantly ($p = 0.05$) less effective on *E. saligna* compared to *P. patula* and *C. lusitanica* (with an average weight loss of 72.03%, 58.43% and 62.98% respectively). Creosote low loading was significantly more effective than CCA and PCP low loading (with an average weight loss of 9.86%, 85.44% and 98.16% respectively). Unlike creosote and PCP, CCA high loading treated samples suffered from continuous browsing by termites, which was only restricted to the surfaces of the samples. Hence creosote treated *P. patula* and *C. lusitanica* were more resistant to degradation effective. Four termite species were responsible for degradation of wood: *Odontotermes vulgaris, Ancistrotermes* species, *Macrotermes jeanneli* and *Coptotermes* species.