United States
Department of
Agriculture

Forest Service

Southern Forest
Experiment Station

Research Note

SO-300
August, 1983

A Vacuum-Aspirator for Counting Termites

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SUMMARY

An aspirator-system powered by a vacuum cleaner is described for manually counting termites. It is significantly faster and termite survival is at least as high as when using a mouth-aspirator for counting large numbers of termites.

Keywords: Vacuum-aspirator, termites.

INTRODUCTION

Termites can be reliably counted in a relatively short time using an aspirator in which the suction is created by a small electric vacuum cleaner (Sears® SPV,[2] 110 volt). To minimize noise levels, the vacuum cleaner is placed outside the building and connected to the working area via rigid PVC pipe (2.5 cm inner diameter). The end of a tee connector is left open to reduce the vacuum to an acceptable level. The vacuum can be further minimized by drilling small holes in the PVC pipe. Caution should be taken to reduce the vacuum to a level so as not to injure termites.

A section of PVC pipe is positioned along the back of a work table to form a manifold into which several aspirators can be inserted and used at the same time (fig. 1). One section of a Nalgene® quick-

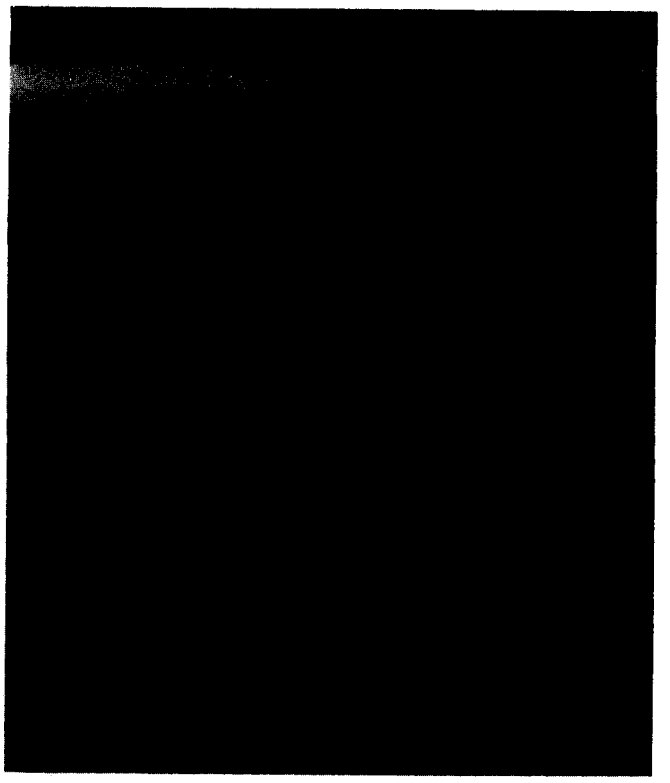

Figure 1.—*Vacuum manifold with aspirators for counting subterranean termites.*

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disconnect tubing connector is fitted in each hole drilled at intervals along the pipe. Aspirators, similarly fitted with connectors, then are hooked up to the manifold by appropriate lengths of Tygon® tubing.

Aspirators, modified 30-dr plastic pill containers, are fitted with a pick-up nozzle and vacuum connector. The nozzle is made from a 20-cm length of 6 mm (outer diameter) glass tubing bent at right angles approximately 5 cm from one end. This end is heated and forced through the center of the plastic container lid. The tubing connector is inserted through a hole drilled next to the glass tube in the cap. A small piece of copper screen is heated and secured over the interior opening of the tubing connector to prevent termites and debris from being drawn out of the container. Silicon caulking compound is useful for sealing leaks in the cap. Adjustable clamps on each piece of Tygon® tubing will regulate the vacuum to each aspirator.

The dimensions given for the vacuum system are appropriate for counting subterranean termites (*Reticulitermes* spp. and *Coptotermes formosanus* Shiraki) as they are aspirated. For other types of insects, the system might be modified by adjusting the vacuum and tubing diameters.

The methods were compared by timing how long it took to count five replicates of 100 *Reticulitermes flavipes* (Kollar) workers from each of three colonies. Termites were placed on wood and moist sand, and survival was determined after either 1, 2, 3, or 4 weeks. The vacuum-system method was significantly faster than, and percent termite survival (square root transformation) was at least as high as, the mouth-aspirator method (F-test, $P < 0.05$).

Members of our laboratory routinely use this vacuum aspirator system to count large numbers of termites. Advantages over a mouth-aspirator include operator safety and the capability for counting large numbers of termites over long periods of time. Continuous use of a mouth-aspirator often results in sore lips and occasionally an infected throat.

Those who contributed ideas to the design and construction of aspirator systems leading to the current one include: John Tynes, Kenneth Tynes, Alton Gipson, Carley Baxter, Eldon Mallette, Nely Rich, and Rubien Yates.

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