

## RESEARCH NOTE

### A ROTATING BENCH FOR GLASSHOUSE EXPERIMENTATION

R O BARNARD and W J FÖLSCHER, Department of Soil Science and Plant Nutrition  
University of Pretoria

#### Introduction

In most investigations of a scientific nature and especially in biological studies it is necessary to include a number of replicates of each treatment to ensure accuracy, (Cochran and Cox, 1957; Ostle, 1963).

This is certainly true of pot experiments in glasshouses, where growth can be differentially affected by light and/or temperature differences caused by the construction of the particular unit. For this reason it is virtually standard practice to include at least four replicates in pot experiments, where this is at all possible.

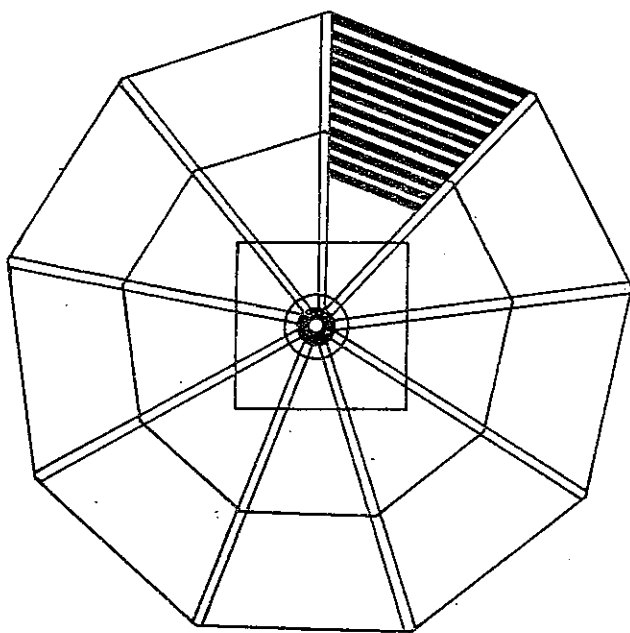
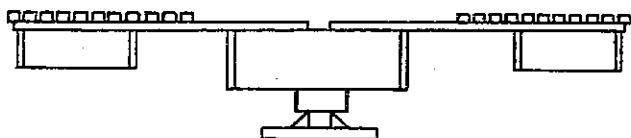


Fig 1 Details of rotating glasshouse bench

A large number of pot experiments have been conducted by this department over the past fifteen years. However, despite adequate replication and extreme care in preparation and management, which includes systematic manual rotation of pots, the desired reproducibility was often not obtained.

It was decided, therefore, that the merits of a revolving bench should be investigated in the glasshouse.

#### Construction of bench

The bench was designed by the authors as illustrated in Fig. 1, and constructed by Messrs Revolvit (Pty) Ltd, Denver, Transvaal. It is circular 4,5 m (15') in diameter and 750 mm (2'6") high.

The outer 1,2m (4') is covered in Miranti slats approximately 38 mm (1 1/2") x 25 mm (1") with approximately 50 mm (2") between the slats.

A drip tray is situated 230 mm (9") below the top of the bench, extending inwards approximately 900 mm (3'), and made of 6,4 mm (1/4") asbestos sheeting.

The bench is designed to operate with an evenly distributed mass of 1360 kg (3,000 lbs) and rotates at the rate of one revolution every ten minutes. The driving mechanism consists of a 0,75 kW (one horsepower), single phase electric motor, with two gearboxes to reduce the speed. The motor and gearboxes are housed under the centre of the table and are adequately protected from water which is used for spraying the floor of the glasshouse.

#### Reliability

The rotating glasshouse bench, described above, was installed in 1970 and two uniformity experiments were conducted during 1971. For both of these the coefficient of variation was of satisfactory order for work of this nature (Average 7,8%).

#### References

- COCHRAN, W.G. & COX, G.M., 1957. *Experimental Designs*. 2nd. ed. New York: John Wiley & Sons, Inc.  
OSTLE, B., 1963. *Statistics in Research*. 2nd. ed. Iowa: Iowa State University Press.