

Sure Gro's
BHP Landcare Award
Winning Research

Victorian Section 1991



This Research Reveals

Increased Seedling

- Growth Rates
- Trunk Diameters
- Higher Survival Rates

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BHP Landcare Winners

For the *Sure Gro* High Performance Guards

Research Results

These results have been taken from 7 Victorian research sites which encompass most environmental conditions across the state. Twenty four different types of tree guards and two different planting methods have been analysed.

Statistical analysis of the research data, has proven that *Sure Gro* Tree Guards out perform all other Tree Guards regardless of the environmental conditions

Seedling DEATH Rates

Seedling death rates are a high cost item in any planting. This research clearly shows that the incidence of seedling deaths can vary with different tree guard types and between different research sites.

Findings to date indicate that the harsher the environmental conditions, the **greater the importance of Tree Guards**. For instance, our North Eastern Research Site at Springhurst suffered a severe drought during the first year. The following graph shows the impact of different types of guards affecting seedling survival rates at the site since planting.

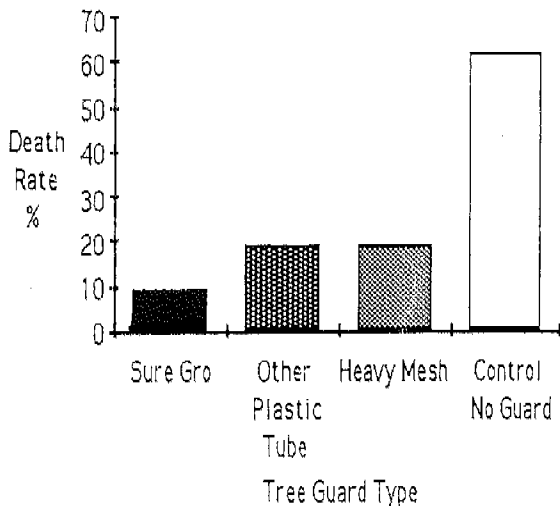


Figure 1. Seedling DEATH rates in various tree guards, where drought was experienced in the first year of growth. The control in all cases has the same treatment, but no guard.

Sure Gro Tree Guards have continued out perform all other guards trialed in reducing seedling death rates. Seedling death rates will vary accordingly with the harshness of the environment. Average seedling death rates across all 7 research sites are shown in figure 2.

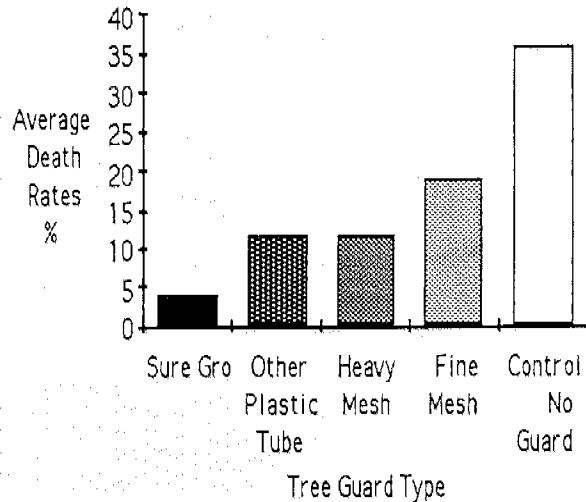


Figure 2. The effect of different Tree Guards on seedling Death Rates across all Victorian Research Sites.



Photo 1. Seedlings subjected to high wind pressure. Note the lack of weed competition and the way the correctly fitted bamboo stakes hold the guards in place.

Sure Gro Tree Guards produce the LARGEST Trunk Diameters

This research dispels the myth that trees subjected to high winds, such as where no guards or fine mesh guards are used, will build better trunk and root structures. On sites that produced statistically significant results (6 & 7), seedling grown in **Sure Gro Tree Guards produced the largest trunk diameters.** Strong trunk and root structures are required to support trees in the exposed environment into which they are now being planted.

Relative Statistical Significance of Trunk Diameters expressed as a percentage between Guard Types

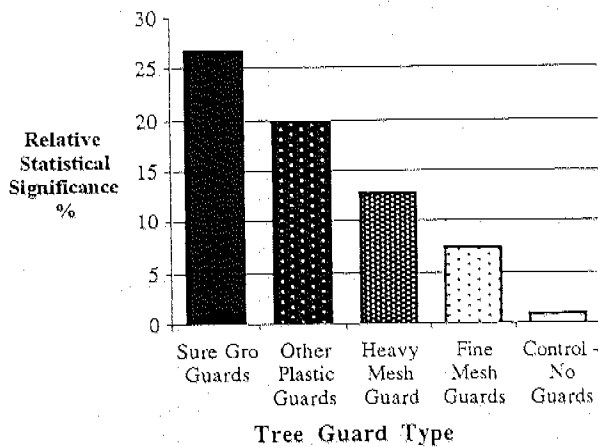
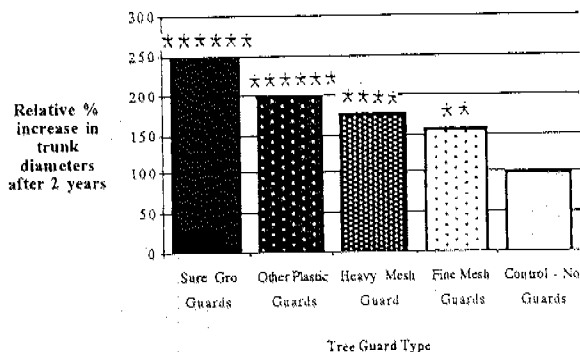


Figure 3: Relative Statistical Significance of Trunk Diameter for seedlings growing in various tree guard types across the state.

The graph below shows statistical results of increased trunk diameters from our Western District research Site.

Level of Statistical Significance is Indicated By the Stars.



Tree Guards significantly effect trunk structures as shown by this research. **Sure Gro Tree Guards have continued to produce larger trunk structures than all other tree guard types trialed.** Sure Gro Tree Guards are complex solar radiation filters. They are made from a blend of specialist polymers and additives which manipulate specific bands of solar radiation. These bands impact on plant hormone production which improves plant growth rates and trunk structures.

Seedling Growth Rates.

Seedlings grown in **Sure Gro Tree Guards** have continued to out perform all other seedlings grown in the other tree guard types trialed. They have more than doubled the growth rate after 2 years, on low weed competition sites, when compared with the unguarded control trees. It appears that the initial rapid growth responses shown in earlier bulletins have continued even when the trees are well above the guards and subjected to other environmental pressures.

The influence of **Sure Gro Tree Guards** on the seedling growth rates in seen in figure 5.

Percentage increase in height compared with the Control (unguarded seedlings).

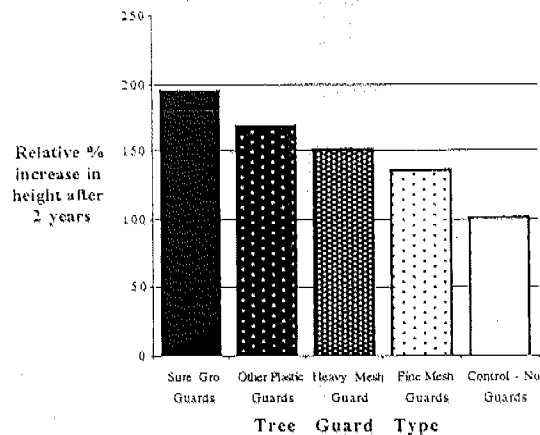


Figure 5. Percentage increase in HEIGHT over two years on a site with reasonable weed control.

uV Radiation

Our research has shown that uV radiation appears to be a factor in reducing the survival rates of seedlings. Currently we estimate that between 10 to 20% seedling losses can be attributable to the impact of uV radiation. Similar results have been observed by other researches (1).

Sure Gro Tree Guards have been designed to substantially reduce the impact of uV radiation on the seedlings and therefore increase survival rates. This has been achieved through extensive research with polymer types and selected additives. It has allowed us to reflect and absorb most incident uV radiation. This ensures average survival rates are about 10% higher than the best of other available products.

With the average cost of replanting at about \$3.50 per tree, a 10% increase in seedling survival rates, represents a significant saving in the revegetation budget.

High Temperature Burning

High temperature burning of seedlings is commonly reported as a problem with plastic tube tree guards. Sure Gro have eliminated this problem by a careful selection of polymer types and additives after extensive radiometry and spectrophotometry research.

Planting in Single Rip Lines

Our research has shown that a high proportion of seedlings planted in single rip lines have blown over, particularly when the guards have failed. Such a trend was not evident with trees grown in Sure Gro Tree Guards, however we do not recommend planting in single rip lines.

How long is a Tree Guard Required ?

Tree Guards should remain in place until the trees are 1.5m high. In southern Australia this can be in excess of 2 years in harsh conditions.

Weed Control

Weed competition substantially reduces growth rates, trunk diameter and seedling survival rates. Weak spindly seedlings result which appear to be more susceptible to serious insect attack.

General Recommendations on Weed Control

For optimum seedling response, we recommend that weed control needs to extend for a 1.5m radius around each seedling, preferably for a period of about 2 years. (This recommendation needs to be modified according to likely erosion consequences). We recommend the use of knockdown and residual herbicides for effective weed control.

Recycled Paper or Jute Weed Mats are beneficial as a **secondary weed control** within the guards. The choice of weed mat used, depends on the slope or conditions present, as the recycled paper weed mats are unsuitable for steep slopes.

Life of a Sure Gro Tree Guard.

Sure Gro Contractor Tree Guards will last from 18 months to 2 years when used with bamboo stakes.

Sure Gro High Performance Tree Guards have a life expectancy of greater than 3 years and are able to be reused for planting a second time.

Research details

Research details are available on request for any of the Victorian researches sites.

1. A ref. list on uV radiation is available on request. eg. Forest 2000 - effects of atmospheric change. AB Pittock, Aus. For 50, No 4 - Pgs 205 - 215.

Statistical Significance.

Based on unpaired T Test values

***** $P \leq 0.0005$ Confidence Interval
***** $0.0005 \leq P < 0.005$ Confidence Interval
**** $0.005 \leq P < 0.001$
*** $0.001 < P < 0.025$
** $0.025 \leq P < 0.05$ Confidence Interval
* $0.05 \leq P$ Confidence Interval