Frost + Grazing Protection

Product combination trial on seedlings

Purpose

This document contains a report on a small trial combining application of a frost protection spray (Wiltnot) and grazing deterrent (SenTree) to determine whether combined application of the products has a detrimental effect on seedling health.

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Trial Summary

In large-scale revegetation projects, the simultaneous application of both frost protection and grazing deterrents is desired. However, it is currently unknown whether these two treatments can be safely applied together without adverse effects on native seedlings. To address this, a controlled trial was conducted to assess the compatibility and safety of applying Wiltnot (frost protectant) and SenTree (grazing deterrent) concurrently.

A total of 120 native seedlings, comprising a mix of *Eucalyptus* and other common midstorey species, were used. Two treatment batches were established, with Batch 1 using a Label rate application of both products, and Batch 2 using 3 x label rate application of both products (to test safety margins and simulate potential operator error).

Each of the 12 species had 5 seedlings per batch. The trial commenced with product applications on June 10–11, 2025, during low winter temperatures. Seedling health was assessed weekly over a four-week period, evaluating leaf browning, wilting, general plant health, and mortality.

The Wiltnot was applied first with Batch 1 applied at label rate (50ml/L) via knapsack on June 10 at 3:30 pm. Batch 2 was applied immediately following at 3 x rate (150ml/L) at 4:00 pm. These were left for a drying period of 24 hours.

The SenTree was applied after 24 hours with Batch 1 at label rate on June 11 at 3:30 pm. Batch 2 was applied immediately following at 3 x rate application with added adhesive and grit at 4:00 pm. Achieving 3 x grit adhesion was impractical in practice due to product limitations.

Assessment Findings Week 1 – 18 June 2025

- No negative effects observed.
- All seedlings rated in excellent health.
- Minor leaning in *E. gracilis* and *M. lanceolata* due to soil washout.

Assessment Findings Week 2 – 25 June 2025

- Minor leaf brownout observed in A. verticillata, E. fasciculosa, and E. leucoxylon (both batches).
- Additional lower yellowing in O. ramulosa (Batch 2).
- Brownout deemed **seasonal** rather than treatment-induced.
- All seedlings remained in excellent health.

Assessment Findings Week 3 – 2 July 2025

- Brownout extended to *B. marginata*, *E. baxteri*, *E. gracilis*, and *E. porosa* (Batch 1).
- Similar symptoms in *E. porosa* and *O. ramulosa* (Batch 2).
- *E. leucoxylon* had the most noticeable discolouration.
- No concerning signs of stress; all seedlings thriving.

Assessment Findings Week 4 – 11 July 2025

- Increased leaf brownout percentages, particularly in *E. leucoxylon*.
- Surprisingly, higher brownout in Label Rate batch than in 3 x Rate, suggesting variation is due to individual plant responses, not treatment concentration.
- No mortality, no wilting, and new growth observed across most species.

In summary, over the four-week trial no seedling deaths occurred, with all seedlings maintaining excellent overall health, with no observed wilting or dieback. Minor leaf discolouration was seen, mainly in *E. leucoxylon* and *E. fasciculosa*, but this was not correlated with application rate and likely due to seasonal changes or individual variation. New growth was evident in most species by Week 4, indicating continued plant vitality.

Based on these trial outcomes, simultaneous application of Wiltnot and SenTree (at label rates) is deemed safe and well-tolerated by a range of native seedling species. Application at up to 3 x label rate did not result in negative impacts, indicating a robust safety margin that accommodates potential field application errors.

It is recommended that this combination could be adopted as a safe practice in revegetation projects, with confidence that it poses minimal risk to seedling health when used as described.

During the trial, a rabbit entered the nursery through a tear in the boundary mesh and caused significant damage to untreated seedlings of Allocasuarina verticillata, Olearia ramulosa, and Acacia melanoxylon adjacent to the trial seedlings. However, the trial seedlings treated with Wiltnot and SenTree remained untouched, supporting the effectiveness of SenTree in preventing grazing damage.

Introduction

Application of both a frost control and a grazing deterrent is required for mass use on seedlings in revegetation projects. It is unknown whether these two products can safely be used at the same time so a small test was set up to determine if they can.

120 native seedlings of varying species were purchased and separated into two batches, one batch for an application at label rate of both products, the other batch for application at 3 x label rate of both products. The second batch is designed to ensure a safety margin for application at label rate, allowing for potential operator application error.

Each species chosen had 5 x seedlings per batch. The species chosen were a mix of Eucalyptus overstorey seedlings and some common midstorey species with both large and small leaves. The species chosen are shown below.

Botanical name	
Acacia melanoxylon	Eucalyptus fasciculosa
Acacia provincialis	Eucalyptus gracilis
Acacia pycnantha	Eucalyptus leucoxyon
Allocasuarina verticillata	Eucalyptus porosa
Banksia marginata	Melaleuca lanceolata
Eucalyptus baxteri	Olearia ramulosa

The seedlings were sprayed with a frost protectant (Wiltnot) and a grazing deterrent (SenTree) on the 10th and 11th of June 2025 at a time when temperatures were regularly experiencing low winter numbers.

The nursery owner was contracted to perform health assessments on the seedlings at 1-week, 2-week, 3-week, and 4-week intervals, noting seedling condition including wilting, leaf brownout, general plant health, and if any plants had died from the dual treatments.

Wilting and leaf brownout were rated at a percentage of all plants, with brownout referring to discolouration of the leaf[1]. General plant health was rated as Poor, Good, or Excellent and the quantity of plant deaths was recorded as actual numbers that died.

From this information, recommendations were created to be provided to the broader Revegetation industry.

[1] Leaf Brownout measurements included measurements of lower leaf discolouration as well as leaf colour changes due to temperature changes, so whilst these may appear high on the measurement charts, untreated seedlings typically had similar discolourations.

Methodology

The seedlings were separated into the two batches, and the frost protectant (Wiltnot) was mixed up at label rates of 50ml / 1 litre of water. This was applied by knapsack to full coverage of each seedling in Batch 1 on the 10th of June at 3:30 pm.

The mix was then increased to 3 x label rate at 150ml / 1 litre of water. This was applied by knapsack to full coverage of each seedling in Batch 2 on the 10th of June at 4:00 pm

These seedlings were left for a full 24 hours for the product to dry on the leaves. Photos of the batches after WiltNot application are shown below.

Batch 1 – Post Wiltnot application photos

Batch 2 – Post 3 x Wiltnot application photos

Following the 24-hour period to allow the Wiltnot to dry, the SenTree was mixed up at label rates and applied to Batch 1 on the 11th of June at 3:30 pm. The liquid component was mixed and applied using a knapsack and the grit component applied with a small shaker at a typical light dusting.

The mix was then increased to 3 x label rate with additional adhesive and egg grit placed in the water. This was applied by knapsack to full coverage of each seedling in Batch 2 on the 11th of June at 4:00 pm, with the grit component subsequently applied with a small shaker at a significantly thicker than typical application. In actual practice, it was difficult to get more than the typical amount of grit to stick to the leaves, so application of the grit is not true 3 x label rate. Photos of the batches after SenTree applications are shown below.

Batch 1 – Post SenTree application photos

Batch 2 – Post 3 x SenTree application photos

Results

Assessment 1 – 18th June 2025

The first assessment was completed after one week and there were no detrimental effects observed to any of the seedlings from the products applied. All seedlings were in excellent health with a general appearance the same as when the treatment was applied, with a small amount of the treatments washed off by the irrigation.

A minor thing to note was that some of the *Eucalyptus gracilis* and *Melaleuca lanceolata* were leaning over slightly due to some soil washout at the top of the tube. Some photographs at the time of this assessment are below, with a table of the assessment results shown on the following page.

Batch 1 – Assessment 1 photos

Batch 2 – Assessment 1 photos

Batch 1 – Assessment 1 measurements

Botanical name	Quantity	Wilting	Leaf brownout	General health	Quantity died	Other comments
Acacia melanoxylon	5	0%	0%	Excellent	0	
Acacia provincialis	5	0%	0%	Excellent	0	
Acacia pycnantha	5	0%	0%	Excellent	0	
Allocasuarina verticillata	5	0%	0%	Excellent	0	
Banksia marginata	5	0%	0%	Excellent	0	
Eucalyptus baxteri	5	0%	0%	Excellent	0	
Eucalyptus fasciculosa	5	0%	0%	Excellent	0	
Eucalyptus gracilis	5	0%	0%	Excellent	0	Some leaning over due to soil washout unrelated to Wiltnot or SenTree
Eucalyptus leucoxyon	5	0%	0%	Excellent	0	
Eucalyptus porosa	5	0%	0%	Excellent	0	
Melaleuca lanceolata	5	0%	0%	Excellent	0	Some leaning over due to soil washout unrelated to Wiltnot or SenTree
Olearia ramulosa	5	0%	0%	Excellent	0	

Batch 2 – Assessment 1 measurements

Botanical name	Quantity	Wilting	Leaf brownout	General health	Quantity died	Other comments
Acacia melanoxylon	5	0%	0%	Excellent	0	
Acacia provincialis	5	0%	0%	Excellent	0	
Acacia pycnantha	5	0%	0%	Excellent	0	
Allocasuarina verticillata	5	0%	0%	Excellent	0	
Banksia marginata	5	0%	0%	Excellent	0	
Eucalyptus baxteri	5	0%	0%	Excellent	0	
Eucalyptus fasciculosa	5	0%	0%	Excellent	0	
Eucalyptus gracilis	5	0%	0%	Excellent	0	Some leaning over due to soil washout unrelated to Wiltnot or SenTree
Eucalyptus leucoxyon	5	0%	0%	Excellent	0	
Eucalyptus porosa	5	0%	0%	Excellent	0	
Melaleuca lanceolata	5	0%	0%	Excellent	0	Some leaning over due to soil washout unrelated to Wiltnot or SenTree
Olearia ramulosa	5	0%	0%	Excellent	0	

Assessment 2 – 25th June 2025

The second assessment was completed after two weeks and there was some minor leaf brownout on the *Allocasuarina verticillata*, *Eucalyptus fasciculosa*, and slightly more on the *Eucalyptus leucoxylon* in Batch 1 (Label rate), with the same noted in Batch 2 (3 x Label rate) across the same species, plus some minor lower yellowing on the *Olearia ramulosa*.

Despite these minor leaf brownouts, all seedlings were still in excellent health. At the time of this assessment several other sections of the nursery where the same species were being grown adjacent were compared. It is the assessors view that the brownout is primarily related to seasonal changes in the plants rather than from the treatment.

Some photographs in order beginning from Top Left and moving in a clockwise direction are 1. A general seedling photograph, 2. *Eucalyptus fasciculosa* showing treatment scraped off and leaf colour underneath, 3. *Eucalyptus fasciculosa* showing spotting on upper leaf, and 4. *Eucalyptus leucoxylon* compared to an untreated seedling (untreated on left hand side of photo). A table of results is included on the following page.

Browning – Assessment 2 Photos

Batch 1 – Assessment 2 measurements

Botanical name	Quantity	Wilting	Leaf brownout	General health	Quantity died	Other comments
Acacia melanoxylon	5	0%	0%	Excellent	0	
Acacia provincialis	5	0%	0%	Excellent	0	
Acacia pycnantha	5	0%	0%	Excellent	0	
Allocasuarina verticillata	5	0%	1-10%	Excellent	0	
Banksia marginata	5	0%	0%	Excellent	0	
Eucalyptus baxteri	5	0%	0%	Excellent	0	
Eucalyptus fasciculosa	5	0%	1-10%	Excellent	0	
Eucalyptus gracilis	5	0%	0%	Excellent	0	Some leaning over due to soil washout unrelated to Wiltnot or SenTree
Eucalyptus leucoxyon	5	0%	10-20%	Excellent	0	
Eucalyptus porosa	5	0%	0%	Excellent	0	
Melaleuca lanceolata	5	0%	0%	Excellent	0	Some leaning over due to soil washout unrelated to Wiltnot or SenTree
Olearia ramulosa	5	0%	0%	Excellent	0	

Batch 2 – Assessment 2 measurements

Botanical name	Quantity	Wilting	Leaf brownout	General health	Quantity died	Other comments
Acacia melanoxylon	5	0%	0%	Excellent	0	
Acacia provincialis	5	0%	0%	Excellent	0	
Acacia pycnantha	5	0%	0%	Excellent	0	
Allocasuarina verticillata	5	0%	0%	Excellent	0	
Banksia marginata	5	0%	0%	Excellent	0	
Eucalyptus baxteri	5	0%	0%	Excellent	0	
Eucalyptus fasciculosa	5	0%	1-10%	Excellent	0	
Eucalyptus gracilis	5	0%	0%	Excellent	0	Some leaning over due to soil washout unrelated to Wiltnot or SenTree
Eucalyptus leucoxyon	5	0%	1-10%	Excellent	0	
Eucalyptus porosa	5	0%	1-10%	Excellent	0	
Melaleuca lanceolata	5	0%	0%	Excellent	0	Some leaning over due to soil washout unrelated to Wiltnot or SenTree, new growth tips on all plants
Olearia ramulosa	5	0%	1-10%	Excellent	0	Seasonal yellowing at base of stems

Assessment 3 – 2nd July 2025

The third assessment was completed after three weeks and there was some minor leaf brownout on additional species including *Banksia marginata*, *Eucalyptus baxteri*, *Eucalyptus gracilis*, and *Eucalyptus porosa* in Batch 1 (Label rate), with the same noted in Batch 2 (3 x Label rate) on *Eucalyptus porosa* and *Olearia ramulosa*.

Despite the additional leaf browning, all seedlings were still in excellent health with the *Eucalyptus leucoxylon* being the most discoloured. Further photographs were taken of different species close up with the treatment rubbed off to show the leaf condition under the treatment. These photographs are below, with a table of the assessment results shown on the following page.

Eucalyptus leucoxylon browning – Assessment 3 photos

The photographs in order beginning from Top Left and moving in a clockwise direction are 1. *Eucalyptus leucoxylon* compared to an untreated seedling (untreated on left hand side of photo), 2. *Eucalyptus leucoxylon* treated close-up, and 3. *Eucalyptus leucoxylon* untreated close-up.

Eucalyptus fasciculosa browning – Assessment 3 photos

The photographs below show both sides of the *Eucalyptus fasciculosa* leaf condition.

Acacia pycnantha, Banksia marginata & Eucalyptus baxteri – Assessment 3 photos

The photographs below show a mix of species with the treatment scraped off.

Batch 1 – Assessment 3 measurements

Botanical name	Quantity	Wilting	Leaf brownout	General health	Quantity died	Other comments
Acacia melanoxylon	5	0%	0%	Excellent	0	
Acacia provincialis	5	0%	0%	Excellent	0	
Acacia pycnantha	5	0%	0%	Excellent	0	
Allocasuarina verticillata	5	0%	1-10%	Excellent	0	
Banksia marginata	5	0%	1-10%	Excellent	0	
Eucalyptus baxteri	5	0%	1-10%	Excellent	0	
Eucalyptus fasciculosa	5	0%	10-20%	Excellent	0	Some spots under SenTree particles showing some discolouration
Eucalyptus gracilis	5	0%	1-10%	Excellent	0	Some leaning over due to soil washout unrelated to Wiltnot or SenTree
Eucalyptus leucoxyon	5	0%	30-40%	Good	0	Some spots under SenTree particles showing some discolouration
Eucalyptus porosa	5	0%	1-10%	Excellent	0	
Melaleuca lanceolata	5	0%	0%	Excellent	0	
Olearia ramulosa	5	0%	0%	Excellent	0	

Batch 2 – Assessment 3 measurements

Botanical name	Quantity	Wilting	Leaf brownout	General health	Quantity died	Other comments
Acacia melanoxylon	5	0%	0%	Excellent	0	
Acacia provincialis	5	0%	0%	Excellent	0	
Acacia pycnantha	5	0%	0%	Excellent	0	
Allocasuarina verticillata	5	0%	1-10%	Excellent	0	
Banksia marginata	5	0%	0%	Excellent	0	
Eucalyptus baxteri	5	0%	0%	Excellent	0	
Eucalyptus fasciculosa	5	0%	1-10%	Excellent	0	Some leaf drop at bottom third but new growth from previous assessment
Eucalyptus gracilis	5	0%	0%	Excellent	0	Some leaning over due to soil washout unrelated to Wiltnot or SenTree
Eucalyptus leucoxyon	5	0%	20-30%	Good	0	
Eucalyptus porosa	5	0%	1-10%	Excellent	0	
Melaleuca lanceolata	5	0%	0%	Excellent	0	Some leaning over due to soil washout unrelated to Wiltnot or SenTree, new growth tips on all plants
Olearia ramulosa	5	0%	1-10%	Excellent	0	Seasonal yellowing at base of stems

Assessment 4 – 11th July 2025

The fourth assessment was completed after four weeks and the brownout percentages increased across the affected plants. Despite the additional leaf browning, seedlings were still in excellent health with the *Eucalyptus leucoxylon* being the most discoloured. Interestingly, the *Eucalyptus leucoxylon* seedlings with the Label Rate application of product showed a higher brownout percentage than the seedlings with the 3 x Label Rate application, which further suggests the brownout is related more to the individual seedling than the application. No seedlings died and no seedlings showed signs of wilting or health issues that would present any concern. New growth tips were noted on most species.

Further photographs were taken of the separate batches, and these are shown below with a comparison photo to the seedlings prior to treatment (photos on the left-hand side is prior to any treatment). It is clear from these photos that the seedlings are still healthy and thriving. A table of the assessment results is shown on the following page.

Batch 1 – Assessment 4 photos compared to pre-treatment photos

Batch 2 – Assessment 4 photos compared to pre-treatment photos

Batch 1 – Assessment 4 measurements

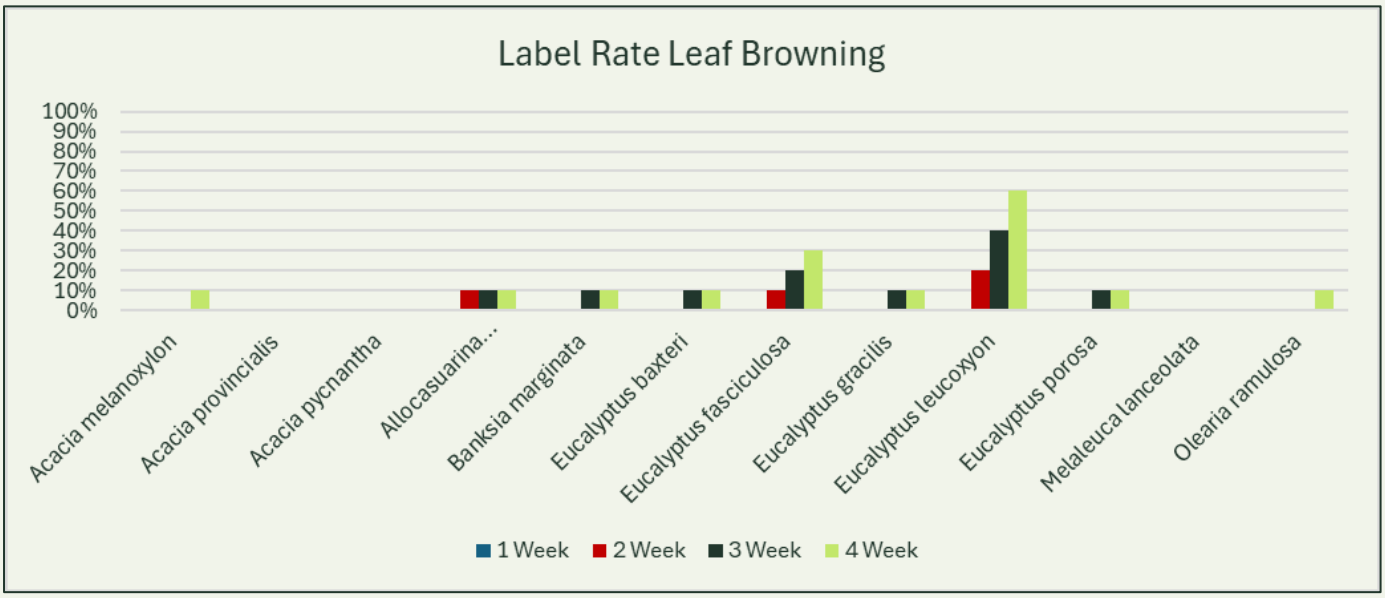
Botanical name	Quantity	Wilting	Leaf brownout	General health	Quantity died	Other comments
Acacia melanoxylon	5	0%	1-10%	Excellent	0	
Acacia provincialis	5	0%	0%	Excellent	0	
Acacia pycnantha	5	0%	0%	Excellent	0	
Allocasuarina verticillata	5	0%	1-10%	Excellent	0	
Banksia marginata	5	0%	1-10%	Excellent	0	
Eucalyptus baxteri	5	0%	1-10%	Excellent	0	
Eucalyptus fasciculosa	5	0%	20-30%	Excellent	0	Some spots under SenTree particles showing some discolouration
Eucalyptus gracilis	5	0%	1-10%	Excellent	0	Some leaning over due to soil washout unrelated to Wiltnot or SenTree
Eucalyptus leucoxyon	5	0%	50-60%	Good	0	Most discolouration on this species
Eucalyptus porosa	5	0%	1-10%	Excellent	0	
Melaleuca lanceolata	5	0%	0%	Excellent	0	
Olearia ramulosa	5	0%	1-10%	Excellent	0	

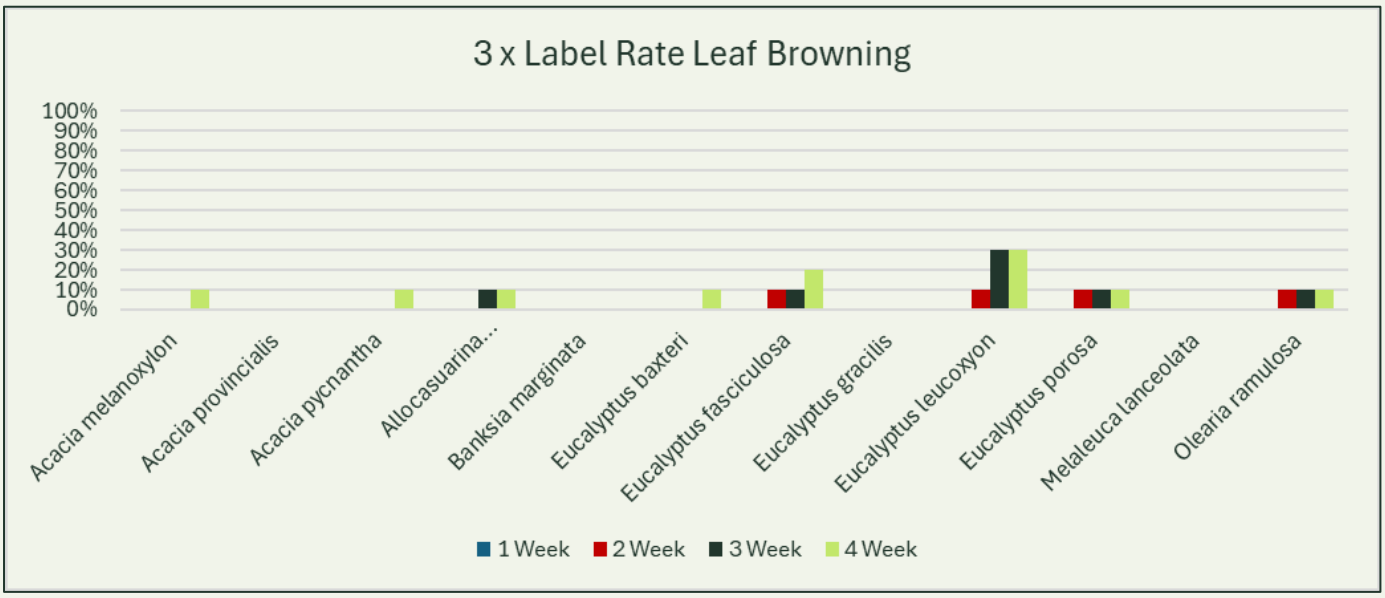
Batch 2 – Assessment 4 measurements

Botanical name	Quantity	Wilting	Leaf brownout	General health	Quantity died	Other comments
Acacia melanoxylon	5	0%	1-10%	Excellent	0	
Acacia provincialis	5	0%	0%	Excellent	0	
Acacia pycnantha	5	0%	1-10%	Excellent	0	
Allocasuarina verticillata	5	0%	1-10%	Excellent	0	
Banksia marginata	5	0%	0%	Excellent	0	
Eucalyptus baxteri	5	0%	1-10%	Excellent	0	
Eucalyptus fasciculosa	5	0%	10-20%	Excellent	0	Some leaf drop at bottom third but new growth from previous assessment
Eucalyptus gracilis	5	0%	0%	Excellent	0	Some leaning over due to soil washout unrelated to Wiltnot or SenTree
Eucalyptus leucoxyon	5	0%	20-30%	Good	0	Most discolouration on this species
Eucalyptus porosa	5	0%	1-10%	Excellent	0	
Melaleuca lanceolata	5	0%	0%	Excellent	0	Some leaning over due to soil washout unrelated to Wiltnot or SenTree, new growth tips on all plants
Olearia ramulosa	5	0%	1-10%	Excellent	0	Seasonal yellowing at base of stems

Summary of Assessments

Summary charts showing the leaf browning over the four-week period are below.





Over the four-week assessment period, all seedlings remained in excellent health with no mortality or signs of stress that would indicate any detrimental impact from the treatments applied sufficient to lead to seedling death either in the nursery or when planted.

Minor leaf browning and yellowing were observed across several species, most notably *Eucalyptus leucoxylon* and *Eucalyptus fasciculosa*. These symptoms were consistent across both the Label Rate and 3 x Label Rate treatments, with no clear correlation between application rate and severity, suggesting that the discoloration is likely due to individual plant response or seasonal variation rather than treatment effect.

Importantly, no wilting or dieback was observed, and new growth was evident on most species by the fourth week. Overall, the seedlings continued to thrive, and the treatments were well-tolerated across all batches. It is the assessors view that combining these two treatments is an acceptable practise with no increased mortality expected.

Additional Bonus Results

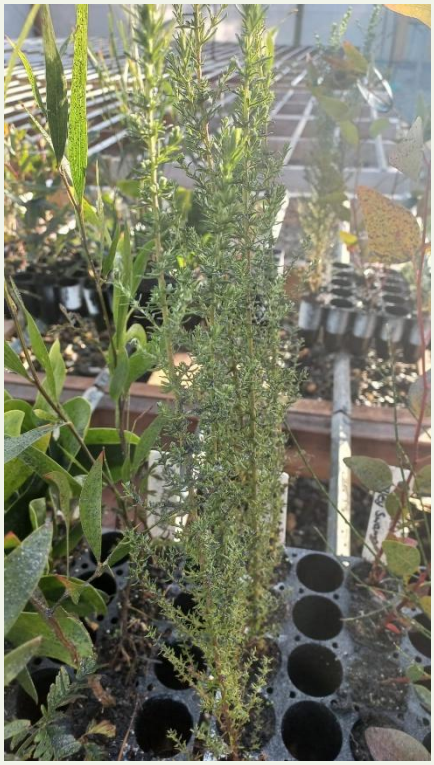
An unexpected additional result from this trial was the presence of a rabbit in the nursery that managed to enter the nursery through a small tear in the boundary mesh. The rabbit managed to graze off seedlings for a period of a few days, during which time it did heavy damage to untreated *Allocasuarina verticillata*, *Olearia ramulosa*, and *Acacia melanoxylon*.

However, the seedlings that were treated with Wiltnot and SenTree suffered zero grazing from the rabbit during this time giving further evidence to the efficacy of the Sentree component of the product at preventing grazing damage. Some photographs of browsed seedlings and the corresponding un-browsed seedlings of the same species are below.

Browsed A. verticillata, O. ramulosa and A. melanoxylon photos



Treated and Un-browsed A. verticillata, O. ramulosa and A. melanoxylon photos


The offending and entirely unrepentant rabbit

Acknowledgements

Creation Care Nursery – Supply of seedlings and trial assessor (Strathalbyn, SA)

Sam Dalton – Trial designer and report author (Mount Barker, SA)

Rabbit – Random occurrence and removal of trial bias[2]

[2] No rabbits were harmed in the trial process or preparation of this report. Offending rabbit was released to the wild.

Disclaimer

This report has been prepared for informational purposes only and is based on a limited trial conducted under specific nursery conditions. While every effort has been made to ensure the accuracy of the observations and conclusions, the results may not be representative of outcomes in all environments or under all application methods.

The authors and associated parties accept no responsibility or liability for any loss, damage, or injury that may result from the use of the information contained herein. Users of this report are advised to conduct their own assessments and trials appropriate to their local conditions and operational requirements before implementing any recommendations.

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