

Palletised nursery logistics[©]

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These proceedings represent an adaption of a pictorial power point presentation made at the South Africa conference of 2016.

The Natural Area Nursery specialises in growing Perth native species from seed for restoration, revegetation, and landscaping.

In 2013 the Natural Area Nursery in Perth, Australia established a distinct propagation area and nursery enclosure to facilitate a new approach to the sowing, germination, and handling logistics with the intention of improving efficiency, reducing staff work load, and handling strain.

The availability of low cost plastic pallets arising from the Western Australian mining boom combined with a large hardstand area gave rise to the concept. Central also to the plan was the expertise developed by the nursery in the germination treatments of many species and the availability of air seeding equipment.

Propagation mix is loaded from soil bin to a hopper and conveyor external to the processing shed.

The air seeding line is comprised of conveyor soil feed, automated composite tray dispenser, tray filler, compactor, and finishing surface brush. The seeder has dibbler, vermiculite top dress, and watering facility when required. The seeding line is coupled to a gravity roller conveyer with capacity for 24 trays. Two composite trays are used, 35 cell (50 × 50 × 120 cm) and 63 cell (40 × 40 × 90 cm). The two trays have essentially identical dimensions of length and width.

The operator sows 24 trays per run and then loads them to 1.1 × 1.1 m pallets, each pallet holding 12 trays. This process is repeated until six pallets are full. The loaded pallets sit on a powered roller conveyor which sits at right angles to the gravity tray conveyor. When all six pallets are loaded, they are powered one at a time to an extension of the powered conveyor which is external to the processing shed. A forklift or skid steer loader with forks moves the sown trays on pallets to one of two germination areas (Figure 1).



Figure 1. Auto seeder germination pallets.

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The two germination areas have different light, temperature, and moisture conditions. When germination is complete and plants strong enough, they are moved by fork to external growing area, some under shade cloth and others to direct light (Figure 2). Sizeable plant movements are done almost exclusively by forklift and mini loader with forks, either to shed for grading and cleaning or to loading area for transport.



Figure 2. Palletised outdoor external growing area.

This nursery facility produces, maintains, and despatches up to 450,000 plants annum⁻¹ with total staff of 1.5 FTE.

Plant tray recycling is undertaken using cages elevated by forklift to chlorination baths for min 48 h as a first step and after to a commercial dishwasher at 90°C for 5 min.