

Choosing plants for your projects

Some ideas from the Landscaper

October 2020



Introduction

Landscape Architects use plants to create dynamic, long-lived outcomes that develop scale and complexity over time as they grow and mature. The choice of plant species and specification of their procurement and installation is one of the most important design decisions for any landscape. Decisions made and implemented during the construction phase will impact the landscape throughout its 50 to 100-year design life.

As a Landscaper, we see landscape designs at their conclusion, when months of work, engagement and deliberation are distilled down to the specification of species, container size, density and the number of plants to be installed. Arriving at this design information is a complex process that considers function, aesthetics, site conditions and management. Typically, we are engaged when the plant design decisions have been made, and our role is to deliver the design vision.

The comments, observations and advice in this paper are intended to give Landscape Architects the benefit of our experience and ensure their design vision is delivered.

Landscape architecture and the role of the Landscaper

Landscape architecture is the delicate blending of landscape function, context, owners' requirements and stakeholders to produce integrated functional designs. The Landscaper's role is to deliver the design to meet the intent of the Landscape Architect. When a Landscaper is brought onto a project, they will often be faced with challenges to deliver the design, including sourcing plant material, requests to reduce the construction cost, and timeline pressures.

The Landscaper will also be concerned with matters related to constructability, safety in design and project completion and handover to the ultimate asset owner.

Every landscape has a unique context, will deliver several functions and have multiple stakeholders. At the outset of every design process these matters will be defined by the designer, and they will influence many design and construction decisions. For the design team decisions to address context, function and stakeholders will be discussed, resolved and documented throughout the design process as it moves through the design and approvals

stages. The final design implicitly represents these works, but in many cases the design rationale is not explicitly defined in the design. Designers should consider how this can be captured and conveyed to the landscaper. The design background and function could be conveyed through a discussion over the plans on site, identifying the desired project outcomes, with reference to the context, function and stakeholder outcomes to be achieved.

“Designers should consider how design rationale can be captured and conveyed to the Landscaper for optimal outcomes”

Selecting a plant by container size

Every plant in a design will be specified in accordance with its species, container size and number. Inherent in these decisions are decisions around cost, lead time, availability and choice of provenance or propagule material.

The table below provides some general data regarding cost, provenance, lead times and general market availability across the range of commonly specified container sizes.

	Tubestock	140mm	16L	45L
Supply Cost	\$1.5 – \$2.50	\$4 - \$8	\$50	\$100 - \$150
Provenance	Yes	Limited	No	No
Lead times	6 months	9 months	6 months	18 months
Species Availability	Good	Moderate	Limited, trees and large shrubs	Limited, trees
Species availability	Wide	Moderate	Moderate	Moderate
Quality risk	Low	Moderate	High	High
Maintenance input	Low	Low	Moderate	High

Figure 1: indicative plant cost by size

Please note the following:

- Cost is a general guide to give the relative cost of plant sizes - the install and maintenance cost is typically 100% to 150% of the supply price
- Provenance – provenance diversity is lost as containers increase, as growers are typically growing for general stock and landscaping supply rather than revegetation markets;
- Lead times reflect reasonable lead times if the stock you require is not already available. Lead time may vary and will increase if seed is not available immediately;
- Market availability reflects the amount of stock in the market and the larger the size, the more likely it is to be run out over the course of the planting season;
- Species availability is greatest with smaller sized pots, as the full range of plants will be grown and larger plant size availability is generally limited to trees.
- Quality risk – holding plants, especially indigenous plants, increase the risk of plant quality issues through factors including root development and health, plant form.
- Maintenance input – the larger the plant container the larger the transplant shock and the more follow up watering required.

Choosing the right plant

As a designer, it will be necessary to navigate these constraints to deliver the landscape. We recommend engaging with a plant supplier early if you are unsure of the availability of plant species or sizes. We also make the point that is no right or wrong in choosing container sizes, and that in time all plants will reach a full and mature size.

Counterintuitively, in our experience plants installed in tube stock will often grow faster and pass larger container stock in 2 to 5 years.

“In our experience and counterintuitively, plants installed in tube stock will often grow faster and pass larger container stock in 2 to 5 years.”

Care needs to be taken with tree stock, especially native trees. Growing trees in containers beyond 140mm always results in a compromise between the size of the tree and its long-term growth habit, as root balls will be restricted by the container. This

restriction makes the trees suffer when transplanted and adds to the post planting maintenance required to ensure the plan successfully establishes. Exotic trees, especially bare root trees, do not suffer the same transplant shock and are able to better establish.

Lead times on plants are lengthy, from a minimum of 6 months for tubestock, to 18 months for advanced stock. Plant selection should consider the availability and production of plants to ensure plants being specified are grown in commercial quantities and readily available. Most plants can be produced to order and will be if growers are given enough warning and guarantees of orders. The risk of plant supply can be diminished by contacting growers during the design phase and allowing enough lead time in the procurement phase of the project.

Provenance

Projects requiring sourcing of plants from specific provenances and seed sources add another layer of complexity. Whilst specialist revegetation nurseries carry a range of seed from their local environment, not every species is carried or maintained by each nursery. Therefore, if provenance is of high importance, discussions with plant suppliers in the early stages of the project are imperative to ensure stock meeting your exact requirements are available come planting time.

Further complicating native plant supply, is the fact that many native species have distinct germination windows (an adaptation honed over millions of years to local conditions). No matter what horticultural tricks are employed, they just will not germinate out of their genetically predetermined window. This means that some species are essentially a 2 year crop from seed to finished plant. Likewise, propagation and planting of winter dormant species in the cooler and lower light levels experienced from April to October is problematic. These varieties, if they can be coaxed to germinate, do not grow well in a production environment, and if planted when dormant, losses are significantly amplified. This is especially true for indigenous aquatic species.

Maintenance considerations

On many projects, there will be multiple asset owners whose jurisdictions overlap. For example, on waterways, the Local Government Authority will have an interest in the linear park elements of the site, and a Catchment Manager will be interested in the waterway and water quality assets. Each asset owner has their own expectations regarding asset design and maintenance, which then needs to be incorporated into design. As part of their initial design process, the Landscape Architect will define the asset owners and their expectations and seek to meet them through the design process. At the point of engagement of the Landscaper, maintenance responsibilities and expectations should be clear. Throughout the construction and maintenance period, asset owners, Landscape Architects and the Landscaper should meet at regular intervals to ensure that all parties are happy with the progress of the landscape. In this way, it will be fit to handover at the conclusion of the maintenance period.

Every asset owner and land manager will have expectations about how assets under their control will be managed. It is recommended that this be discussed and agreed so that the landscape is specified to be consistent with the long-term maintenance regime. For example, if an asset owner has a long-term commitment to maintaining a high amenity landscape and resources to do so are available, a more complex or maintenance intensive landscape can be constructed. If the maintenance inputs will be minimal after handover, the design should be simplified accordingly.

“Maintenance costs are significant and can exceed the value of construction in under 20 years.”

Landscapes are living assets and require constant maintenance throughout their life to continue to meet their functional requirements. Maintenance costs are significant and can exceed construction costs in under 20 years. Given the life of landscape should be a minimum of 50 years, careful consideration should be given to plant selection to reduce long term maintenance costs.

Operational Phase considerations

There are several approaches to achieving this outcome. [The Woody Meadow Project](#) came from a desire to create landscapes that reduced maintenance inputs by having a healthy plant cover that would thrive and suppress weeds. Another alternative is use of trees planted in blocks, whereby mature trees provide shade and compete with weeds for water and nutrient resources. In our experience, monocot plantings tend to have higher maintenance costs as weeds can establish with plantings. This is not to say monocots should not be used, but should be taken into account and acknowledged as part of the design phase. The Woody Meadow Project has been developed by the University of Melbourne with this problem in mind and proposes using low growing shrubs in a media that inhibits weed growth.

Safety in design is also an important consideration. Landscapes that have lower maintenance costs will expose workers to less opportunities for injury. This approach is critical in high risk environments on the side of roads or rail infrastructure. In these environments, workers maintaining the landscape will be exposed to road and rail traffic and the inherent risk of incident and injury. While many things can be done to prevent this, designing out the risk with respect to barriers, restricting planting, and designing a plant palette with less maintenance inputs will reduce the risk to workers.

Site conditions

Conditions from site to site vary significantly due to changes in rainfall, soil conditions, and prevailing winds. Macro site conditions can be addressed for by using plants that are indigenous to the area of the project or have worked in similar landscapes nearby.

Within sites there are challenges due to aspect, soils, drainage etc. We have had sites where the same plant palette applied on opposite sides of the road was highly successful on the south facing slope, yet underperformed on the more exposed north facing slope. This is more difficult to allow for in design and requires adjustments through the build phase to account for variations across the site.

To add to the complexity of this issue, many site conditions only occur in the early years of a project and will settle in time. We have found many sites are very wet through the first couple of years if there has significant soil movement but will “settle down” in time and support the desired vegetation.

“...the same plant palette applied on both sides of a road can provide completely different outcomes”

Every designer must be preparing for climate change and building resilience into their design with the assumption that we will continue to experience warmer and drier climates. You can find more information on the subject of how to design to allow for climate change [here](#).

Constructability

Horticultural projects have the great benefit and challenge of being delivered in a variety of ways, and with time and with good maintenance practices the landscape will grow and mature. Designers are faced with the choice of container size to balance the desire to establish the landscape early, and the cost associated with more mature plants. There are a number of approaches to this problem and in our experience, patience is the best method to establish landscapes. We recommend planting at a density slightly lower than the mature size of the plant. For instance, shrubs that grow to 1.5m in diameter should be planted at 1 metre spacings. We have not found that a high density of plantings in small containers to account for “losses during establishment” is a viable response, as the high density of plants does not give enough soil volume or moisture for the plants to flourish.

One of the greatest features of landscape projects is the use of plants which result in a landscape that changes as the plants grow and mature. On every project, decisions will be made about plant selection and specification that will be the subject of discussions with many stakeholders. Throughout these discussions, the realities of realising the

design in the desired construction window, needs to be considered. On many projects, it is beneficial to engage both the landscape contractor and your chosen nursery to ensure the desired plants will be available when the project is constructed.

