Why are we creating the tool? The WPW project will create an online plant selection tool that will enable practitioners to make more informed plant selections to support sustainable urban landscapes. The online tool will create market opportunities for growers by identifying native and exotic species in a variety of growth forms (trees, shrubs, herbs, climbers, grasses) that are resilient to climate change, for enhancing urban greening, thereby:

* Facilitating sustainable green cities in a changing environment
* Driving sustainable market growth for the horticultural industry
* Developing tools and resources to be used by a wide range of stakeholders

The overarching concept is that there are certain traits of plants that make them resilient to site specific conditions found in urban greenspaces. Once the site limitations are accounted for, the tool will leave end users free to choose plants from a range of aesthetic traits and functional benefits of plants to optimise their particular urban green space.

To start the conversation with our industry contacts, we have compiled a list of design elements and plant traits that seem relevant for the WPW plant selection tool. To construct the list, we:

* Analysed feedback from our stakeholder engagement
* Briefly reviewed site design considerations currently in practice from government guidelines, design textbooks and growers guides
* Reviewed 21 existing online plant selection tools from Australia and around the world to inform the search tool design and identify some possible features that may add to the tool’s utility.

The most common traits used to select plants were those which commonly limit growth under ideal conditions, Climate, Light Requirements, Tolerances/Hardiness and some form of appropriate soil conditions.

The distinguishing aesthetic qualities of the plant were also extremely common: plant form, colour, height and shape.

Many plant selection sites associated plants with appropriate locations, such as streets, gardens or parks or with other benefits such as “bird attracting”.

Importantly, many other traits which were identified as integral to the success of plantings by stakeholders, were not commonly used to select plants. These included maintenance requirements or planting problems or dangers associated with the species. This may be due to the difficulty in defining some of these traits meaningfully. For example, it may be difficult to determine what constitutes a “high maintenance” plant, as this may depend on other factors and be a dynamic trait over the lifetime of the plant.

Although these warnings were often placed in the results of the search, this could be a cumbersome way to rule out unsuitable species and may result in oversights during the selection process.

**Subjective but important traits are an area which can be improved upon with our tool and really address a number of issues raised in the stakeholder engagements.**

We are collecting a large number of traits of plants and are beginning to think how these can be used to suggest appropriate species for urban greenspace locations:

How can we better use these plant traits to save end users time whilst delivering an exciting array of new plant species appropriate to urban green spaces? We are starting to think ahead about how develop criteria to calculate appropriate species for Australian contexts and there are a number of well documented examples.

Certain key criteria can be used to suggest plants specific to certain urban greenspace sites. For example a university team from a European context used the following traits to decide on playgrounds, traffic areas and parks and gardens.

|  |  |  |  |
| --- | --- | --- | --- |
| **Trait** | **Traffic Areas** | **Children's Playground** | **Parks/Gardens/Cemetaries** |
| Drought tolerance | Medium or High |  |  |
| Heat tolerance | Medium or High |  |  |
| De-icing salt tolerance | Medium or High |  |  |
| Soil compaction tolerance | Medium or High | Medium or High | Medium or High |
| Pollution tolerance | Medium or High |  |  |
| Allergenicity | Low | Low | Low |
| Invasive roots | Non-invasive |  | Non-invasive |
| Limb breakage risk | Low | Low | Low |
| Toxicity | Low | Low |  |
| Fruitfall Risk | No |  | No |
| Pollinator attracting |  | Yes | Yes |
| Bird attracting |  | Yes | Yes |
| Spines and thorns |  | No |  |
| Unpleasant odour |  |  | No |
| Edible products |  | Yes |  |
| Native species |  | Yes |  |

There are numerous other examples of assessment criteria we can draw on for urban tree species such as to improve urban forest species selection in California (McPherson, Berry, & van Doorn, 2018). Traits included Soil Texture and pH, Soil Moisture , Sunlight Exposure, Drought Tolerance, Salt Tolerance, Wind Tolerance, Cold Hardiness, Invasiveness and Pests and Disease Risk.

In another example, The Tree Selection Matrix, (Urban Forest Strategy, 2011), used Longevity, Maintenance level, Litterfall and Shade tolerance criteria. Industry professionals rated tree species on a number of key traits on a scale of 1 to 5. The scores are added and the total used to assess the suitability of species to different urban environments such as footpaths, laneways and median strips.

We are collecting species information for these traits, as well as the many functional and aesthetic qualities of plants that are employed in urban design to make our green spaces so fantastic and unique.

Some challenges remain in obtaining the data required...

Questions:

* How to document cultivars and maintain current knowledge of new and high performing cultivars as they enter the market
* How to integrate local species planting lists from councils with our national database
* How to approach the issue of quantifying maintenance
* Is there a definitive method for root depth/required soil volume

McPherson, E. G., Berry, A. M., & van Doorn, N. S. (2018). Performance testing to identify climate-ready trees. *Urban Forestry & Urban Greening, 29*, 28-39.

Urban Forest Strategy, C. o. M. (2011). *Urban Forest Diversity Guidelines*. Melbourne: City of Melbourne Retrieved from <https://www.melbourne.vic.gov.au/SiteCollectionDocuments/urban-forest-diversity-guidelines.pdf>.