

**ANGEL PLACE
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To whom it may concern

Dear Sally

RE: PAUL KEATING PARK - SHADE TOLERANT TURF AND LANDSCAPES ADVICE

Natural and urban environments include a variety of micro-climates from full sun exposure through to complete shade. Wind exposure and rainfall patterns also form a key part of the growing conditions that can influence plant growth. Micro-climatic conditions can limit the range and success of plant species that can grow in certain areas. For example, cacti don't thrive or survive in the shade and rainforest species generally don't succeed in full sun. This is the case for all plant species including trees, palms, shrubs, groundcovers and turf.

In urban areas wind exposure is typically only an issue in front line coastal zones, high up on buildings or in deep CBD "canyons" between tall buildings. In most other areas wind is a minor factor and does not impact plant species selection. Turf is less susceptible to wind impacts than other plant types.

Irrigation is often used in urban areas to overcome inadequate rainfall. Sydney's temperate climate and moderate rainfall patterns support a large variety of plant species, both native and exotic. Irrigation is not always required to ensure successful plant growth. An example of this is the fact that almost all footpath verges are successfully covered in turf that is not irrigated. Many of these turf areas are under the shade of street trees, some of which provide large dense areas of shade.

Shade can be an important limiting factor regarding plant species success, especially turf. Unlike groundcovers, shrubs and trees turf can also be exposed to wear and tear from foot traffic or vehicle use. Like other plant types, certain species of turf are more tolerant of limited direct sunlight. Assuming water is available to the roots, plants grow more vigorously in Summer months than Winter due to warmer soil and air temperatures as well as longer daylight hours and greater sun intensity.

Some species of turf can grow successfully with a minimum of 3 hours of direct (ie full sun) per day. This is the lower limit. In these limited light areas, commonly experienced in Winter due to increased overshadowing from adjacent trees or buildings, turf can still grow however it will not recover quickly from intense use such as regular sport or vehicle traffic. Four, five or more hours of direct continuous sunlight in Winter, ideally through the middle of the day between 10am and 3pm when the sun is its most intense, provide even better conditions for turf growth and increase the ability of turf to tolerate

and recover from wear. Here is some relevant research from an Australian turf expert that supports these comments:

"As a general rule, if you have more than 5 hours of sun per day, you can plant almost all varieties of lawn in South Australia such as couch, kikuyu, buffalo, tall fescue, rye etc. If you get less than 5 hours of sun per day, your options decrease as now you are starting to get into shady territory. Lawns like couch (Santa Ana, Windsor Green,) and kikuyu (Sterile, dwarf, Kenda) really need more than 5 hours per day of full sun so they are the first to drop off when things start to get shady. I wouldn't push these boundaries either because if you plant sun loving grasses in shady areas, they won't survive. That leaves lawns like buffalo, tall fescue, fine leaf rye and even ground cover lawns like Dichondra repens.

Tall fescue, fine leaf rye and Dichondra are the most shade tolerant. They will grow in environments with very little sun however keep in mind that these lawns are neither drought tolerant nor hard wearing. They are more for ornamental purposes or for areas that won't get used much. They should be avoided if you have a dog as they are not self repairing and do not tolerate dog urine.

If you intend to subject your lawn to more traffic like sport, pets and family fun, then you'll need something a little more hard wearing. Soft Leaf buffalo such as Kings Pride may be the answer. Its not as shade tolerant as tall fescue and fine leaf rye but it is more hard wearing and more drought tolerant thanks to its self repairing nature. I'd recommend you have at least 3 hours of sun a day at a minimum to plant buffalo. Any less and it will wear very quickly and be slow to repair."

(source : <https://www.paulmunnsinstantlawn.com.au/blog/the-right-lawn-for-shade/>)

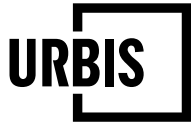
As noted there are turf species able to tolerate as little as 3 hours of direct sunlight per day. Although South Australia is referenced above, these comments are equally applicable to Sydney where there is a much higher rainfall and turf growth is more vigorous due to the more temperate climate.

The Sydney Botanic Gardens and Centennial Park are excellent examples of significant well used public parks where large areas of turf are successfully growing with little direct sunlight under the shade of large evergreen trees such as Figs.

Tall Fescue, Fine Leaf Rye, Durban Grass and several species of Buffalo will be the most successful in 4 hours + of sunlight.

It is important to note that there are a far greater number of groundcover species than turf species capable of tolerating lower light levels and direct sunlight of 4 hours per day or even less. Here is a very small sample of some applicable groundcovers:

- *Viola banksia* (formerly *V. hederacea*) - Native Violet
- *Trachelospermum jasminoides* - Star Jasmine
- *Dichondra repens* - Kidneyweed
- *Liriope* sp.
- *Rhoeo* sp.
- *Ajuga reptans* – Blue Bugle
- *Clivea* sp.
- *Philodendron xanadu* (low shrub)
- *Zoysia* sp.



Shade is a common feature of our urban environment however it does not necessarily preclude plant growth. Suitable turf or groundcover species are readily commercially available that can grow successfully in areas receiving a minimum of 4 hours of direct sun in Winter months and greater amounts of sun for the rest of the year.

Regards

A handwritten signature in black ink that reads "Paul Hardyman". The signature is fluid and cursive, with a long horizontal stroke extending from the end.

Paul Hardyman
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