

Evaluation and Development of New Green Life Alternatives for Bio-retention Swales and Erosion



Plant and Turf Erosion Control Research Update

Quantifying which plant and turf types are best suited to surface erosion protection on slopes, batters and swales

1) Strappy leaf plants and grasses generally strengthen the soil 5 to 20 times more than shrubs and ground covers.



2) Zoysia Nara™ and Empire™ strengthen the soil more than Couch and Kikuyu.



3) Testing used a ground shear tester on replicated samples in ground and in pots.



4) This research calculates the average amount a plant strengthens the soil in percentages and kPa (kilopascals), which is useful for erosion control professionals to choose the appropriate plant or turf.



The following tables detail the best soil strengthening plants and turf based on research completed.

Plant shear vane test results and statistics for Clarendon. The following plants all strengthened the soil significantly.

Groups	Difference to bare soil	Significant?	% increase vs bare soil	Shear strength kPa
Little Rev™ ■	1.39	YES	161%	22.8
Carex appressa	1.52	YES	176%	23.8
Little Jess™	1.55	YES	181%	24.3
Katrinus (b)	1.85	YES	216%	26.9
Tasred® ■	2.15	YES	250%	29.6
Tanika® ■	2.15	YES	250%	29.5
Agapanthus	2.43	YES	283%	32
Lucia™ *	N/A	YES	433.75%	49.3
Tropic Cascade™ * x	N/A	YES	159%	18.6
Shara™ *	N/A	YES	225%	26.2
Best 6 Plants				
Katie Belles™	2.45	YES	285%	32.3
Breeze®	2.56	YES	297%	33.2
Nyalla® ■	2.82	YES	328%	36.1
Katrinus Deluxe (b)	3.15	YES	366%	39.6
Nafray®	4.08	YES	475%	50.3
King Alfred® ●	6.46	YES	752%	70

■ Not recommended for QLD. x Not suited to ACT.

* Based on separate, later test.

● Needs cutting back every 18 months to two years.

Turf shear vane test results and statistics for Clarendon

Turf Type	Significant?	% increase vs bare soil	Shear strength kPa
Bare soil	N/A	N/A	66
Couch	No	3.2%	68.1
Kikuyu	No	9.7%	72.4
Empire™	Yes	48%	97.9
Nara™ *	Yes	58%	105

*Based on a number of later calculations and shear tests and compared to Empire, then extrapolated into the previous format

For more detail, visit ozbreed.com.au/landscape-gardening-plants-and-turf-research.

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Testing plants and turf for inundation tolerance in Bio-retention swales.

1) Evergreen plants look better, and most importantly do not have long dormant periods of low nutrient reduction. Eg; wet feet tolerant evergreen *Lomandra* removes heavy metals and nutrients all year round, whilst *Carex* and *Juncus* are often brown and dormant for up to 6 months of the year.



Carex and Juncus going brown, reducing nutrient absorption



Katie Belles™ Lomandra

2) Many new ornamental plants that have superior looks and performance are showing good wet feet tolerance for Bio-retention swales that get periodically inundated.



3) Many of the new wet feet tolerant plants also have far superior drought tolerance.



4) New breeding has greatly increased the wet feet ability of certain plants. Eg; *Westringia* is not normally able to handle long periods of wet, but *Grey Box™ Westringia*, and *Mundi™ Westringia* have shown amazing abilities to handle wet.



Rating of Bio-retention swale planting 2017

	Avg. rating over 3 plants 0=dead 10=mostly healthy
Exotic types with low or no seed set	
Amethyst™ Liriope	5
Just Right® Liriope	7
Cosmic Pink™ Rhapsiolepis	7
Cosmic White™ Rhapsiolepis	9
Obsession™ Nandina	0
Blush™ Nandina	9
Native types	
Nara™ Native Turf	9
Shara™ Lomandra	9
Lucky Stripe™ Lomandra	8
Evergreen Baby™ Lomandra	7
Tanika® Lomandra	0
Tropic Cascade™ Lomandra	8
Katie Belles™ Lomandra	8
Little Jess™ Dianella	3
Lucia™ Dianella	4
Better John™ Callistemon	9
Green John™ Callistemon	9
Macarthur™ Callistemon	9
Slim™ Callistemon	9
Luscious® Tristaniopsis	4
Ozbreed Aussie Box® Westringia	6
Grey Box™ Westringia	9
Low Horizon™ Westringia	6
Mundi™ Westringia	9
Naringa™ Westringia	4
VitraTech Lomandra	9

Note: planted winter 2016. Just over two years old at rating. Rounded to nearest number. Mostly rated based on three plants per type.

Previous trials in drainage swale 2008–2017

	Avg. rating over 3 plants 0=dead 10=mostly healthy
Turf	
Nara	9
Kikuyu	4
Couch	5
Empire	9
Native plants	
Mundi™ Westringia	9
Naringa™ Westringia	0
Grey Box™ Westringia	9
Shara™ Lomandra	10
Evergreen Baby™ Lomandra	8
Nafray® Pennisetum	9

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