Plant Tissue Analysis

SESL AUSTRALIA
Environment & Soil Sciences

Sample Drop Off: 16 Chilvers Road, Thornleigh NSW 2120
Mailing Address: PO Box 357, Pennant Hills NSW 1715
Tel: 1300 30 40 80
Fax: 1300 64 46 89
Em: info@sesl.com.au
Web: www.sesl.com.au

Batch N°: 53283 **Sample N°: 1** **Date Received: 26/6/19** **Report Status: Final**

Client Name: **Deakin University**
Client Contact: **Tim Tutt**
Client Order N°:
Address: **PO Box 423, Warrnambool VIC**

Project Name: **Floating Reef Bed - Heywood**
SESL Quote N°:
Sample Name: **Sample 1**
Description: **Plant Tissue**
Test Type: **PT_F**

PLANT DETAILS

Plant type: Turf
Species name: Tall Fescue
Botanic name: *Festuca arundinacea*
Sampling time:
Plant part: Clippings
Growth stage: Mature plant

SUMMARY AND RECOMMENDATIONS

A catalogue of Phragmites tissue analysis is not available so ranges for another tall grass are shown.
For every kilogram of material removed, a simple conversion shows the following nutrient removal in grams:
N 24g; P 3.13g; K 20.1g; Ca 4.9g; Mg 2.6g; S 7g.

Trace element removal is shown in milligrams per kilogram.

CRITICAL RATIOS (x:1)

Ratio	Ideal	Result	Low / -20% / Ideal / +20% / High
N : P	10:1	**7.7**	N — P
N : K	1:1	**1.2**	N — K
N : S	15:1	**3.38**	N — S
P : Fe	29:1	**42.5**	P — Fe
K : Ca	4:1	**4.11**	K — Ca
K : Mg	8:1	**7.7**	K — Mg
K : Na	9:1	**8.55**	K — Na
Ca : Mg	2:1	**1.87**	Ca — Mg
Ca : Zn	45:1	**376.15**	Ca — Zn
Ca : B	300:1	**710.76**	Ca — B
Fe : Mn	>1:1	**0.18**	Fe — Mn
Zn : Cu	7:1	**13**	Zn — Cu

PLANT AVAILABLE NUTRIENT PROFILE

ESSENTIAL MACRONUTRIENTS	N - Total %	**2.4**	NITROGEN - Normal Range: 3.4 - 4.65 %
	P %	**0.313**	PHOSPHORUS - Normal Range: 0.34 - 0.50 %
	K %	**2.01**	POTASSIUM - Normal Range: 3.0 - 4.0 %
	Ca %	**0.489**	CALCIUM - Normal Range: 0.4 - 0.45 %
	Mg %	**0.261**	MAGNESIUM - Normal Range: 0.24 - 0.29 %
	S %	**0.711**	SULPHUR - Normal Range: 0.4 - 0.44 %
ESSENTIAL MICRONUTRIENTS	Fe mg/kg	**73.6**	IRON - Normal Range: 83 - 167 mg/kg
	Mn mg/kg	**405**	MANGANESE - Normal Range: 54 - 74 mg/kg
	Zn mg/kg	**13**	ZINC - Normal Range: 28 - 64 mg/kg
	Cu mg/kg	**<1**	COPPER - Normal Range: 9 - 15 mg/kg
	B mg/kg	**6.88**	BORON - Normal Range: 15 - 20 mg/kg
	Mo mg/kg	**-**	MOLYBDENUM - Normal Range: 0.69 - 1.21 mg/kg
	Cl %	**0.68**	CHLORIDE - Normal Range: 0.20 - 0.30 %
	Na %	**0.235**	SODIUM - Normal Range: 0.1 - 0.2 %

Category	Description
Excessive	Potential phytotoxic response. No nutrient addition required. Luxury consumption.
High	Nutrient level is more than adequate and luxury consumption may be occurring.
Normal	The most desirable category. Nutrient additions appropriate for most plants.
Low	Potential "hidden hunger" or subclinical deficiency.
Deficient	Growth is likely to be severely depressed and deficiency symptoms present.

D.N.T. or " - " denotes "Did not test."

Other Elements (mg/kg)

Nitrate NO_3	Aluminium Al	Nickel Ni	Cobalt Co	Selenium Se	Silicon Si	Iodine I
41	**D.N.T.**	**D.N.T.**	**D.N.T.**	**D.N.T.**	**D.N.T.**	**D.N.T.**

Consultant: Stephen Cox
Authorised Signatory: Declan McDonald
Date Report Generated: 5/07/2019

Plant tissue testing and nutrient ranges are not absolute indicators of adequate nutrition. Nutrient concentration is affected by plant part sampled, nutrient ratios, age of tissue, varietal differences, weather conditions at sampling, dust and pesticide residue on foliage, and other factors affecting plant health (insects, nematodes, diseases, etc).

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Batch N°: 53283 **Sample N°: 2** **Date Received: 26/6/19** **Report Status: Final**

Client Name: **Deakin University**
Client Contact: **Tim Tutt**
Client Order N°:
Address: **PO Box 423, Warrnambool VIC**

Project Name: **Floating Reef Bed - Heywood**
SESL Quote N°:
Sample Name: **Sample 2**
Description: **Plant Tissue**
Test Type: **PT_F**

PLANT DETAILS

Plant type: Turf
Species name: Tall Fescue
Botanic name: *Festuca arundinacea*
Sampling time:
Plant part: Clippings
Growth stage: Mature plant

SUMMARY AND RECOMMENDATIONS

A catalogue of Phragmites tissue analysis is not available so ranges for another tall grass are shown.
For every kilogram of material removed, a simple conversion shows the following nutrient removal in grams:
N 32.9g; P 3.49g; K 25g; Ca 7.84g; Mg 3.86g; S 11.9g.

Trace element removal is shown in milligrams per kilogram.

CRITICAL RATIOS (x:1)

Ratio	Ideal	Result	Low / -20% / Ideal / +20% / High
N : P	10:1	**9.4**	N — P
N : K	1:1	**1.3**	N — K
N : S	15:1	**2.76**	N — S
P : Fe	29:1	**42.4**	P — Fe
K : Ca	4:1	**3.19**	K — Ca
K : Mg	8:1	**6.48**	K — Mg
K : Na	9:1	**10.37**	K — Na
Ca : Mg	2:1	**2.03**	Ca — Mg
Ca : Zn	45:1	**366.36**	Ca — Zn
Ca : B	300:1	**1066.67**	Ca — B
Fe : Mn	>1:1	**0.2**	Fe — Mn
Zn : Cu	7:1	**21.4**	Zn — Cu

PLANT AVAILABLE NUTRIENT PROFILE

ESSENTIAL MACRONUTRIENTS	N - Total %	3.28	NITROGEN - Normal Range: 3.4 - 4.65 %
	P %	0.349	PHOSPHORUS - Normal Range: 0.34 - 0.50 %
	K %	2.5	POTASSIUM - Normal Range: 3.0 - 4.0 %
	Ca %	0.784	CALCIUM - Normal Range: 0.4 - 0.45 %
	Mg %	0.386	MAGNESIUM - Normal Range: 0.24 - 0.29 %
	S %	1.19	SULPHUR - Normal Range: 0.4 - 0.44 %
ESSENTIAL MICRONUTRIENTS	Fe mg/kg	82.4	IRON - Normal Range: 83 - 167 mg/kg
	Mn mg/kg	402	MANGANESE - Normal Range: 54 - 74 mg/kg
	Zn mg/kg	21.4	ZINC - Normal Range: 28 - 64 mg/kg
	Cu mg/kg	<1	COPPER - Normal Range: 9 - 15 mg/kg
	B mg/kg	7.35	BORON - Normal Range: 15 - 20 mg/kg
	Mo mg/kg	-	MOLYBDENUM - Normal Range: 0.69 - 1.21 mg/kg
	Cl %	0.67	CHLORIDE - Normal Range: 0.20 - 0.30 %
	Na %	0.241	SODIUM - Normal Range: 0.1 - 0.2 %

Category	Description
	D.N.T. or " - " denotes "Did not test."
Excessive	Potential phytotoxic response. No nutrient addition required. Luxury consumption.
High	Nutrient level is more than adequate and luxury consumption may be occurring.
Normal	The most desirable category. Nutrient additions appropriate for most plants.
Low	Potential "hidden hunger" or subclinical deficiency.
Deficient	Growth is likely to be severely depressed and deficiency symptoms present.

Other Elements (mg/kg)

Nitrate NO_3	Aluminium Al	Nickel Ni	Cobalt Co	Selenium Se	Silicon Si	Iodine I
40.8	**D.N.T.**	**D.N.T.**	**D.N.T.**	**D.N.T.**	**D.N.T.**	**D.N.T.**

Consultant: Stephen Cox
Authorised Signatory: Declan McDonald
Date Report Generated: 5/07/2019

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Batch N°: 53283 **Sample N°: 3** **Date Received: 26/6/19** **Report Status: Final**

Client Name: **Deakin University**
Client Contact: **Tim Tutt**
Client Order N°:
Address: **PO Box 423, Warrnambool VIC**

Project Name: **Floating Reef Bed - Heywood**
SESL Quote N°:
Sample Name: **Sample 3**
Description: **Plant Tissue**
Test Type: **PT_F**

PLANT DETAILS

Plant type: Turf
Species name: Tall Fescue
Botanic name: *Festuca arundinacea*
Sampling time:
Plant part: Clippings
Growth stage: Mature plant

SUMMARY AND RECOMMENDATIONS

A catalogue of Phragmites tissue analysis is not available so ranges for another tall grass are shown.
For every kilogram of material removed, a simple conversion shows the following nutrient removal in grams:
N 30.3g; P 3.2g; K 22.6g; Ca 7.64g; Mg 2.89g; S 10.8g.

Trace element removal is shown in milligrams per kilogram.

CRITICAL RATIOS (x:1)

Ratio	Ideal	Result	Low -20% Ideal +20% High
N : P	10:1	**9.5**	N — P
N : K	1:1	**1.3**	N — K
N : S	15:1	**2.81**	N — S
P : Fe	29:1	**33**	P — Fe
K : Ca	4:1	**2.96**	K — Ca
K : Mg	8:1	**7.82**	K — Mg
K : Na	9:1	**8.56**	K — Na
Ca : Mg	2:1	**2.64**	Ca — Mg
Ca : Zn	45:1	**317.01**	Ca — Zn
Ca : B	300:1	**670.18**	Ca — B
Fe : Mn	>1:1	**0.26**	Fe — Mn
Zn : Cu	7:1	**24.1**	Zn — Cu

PLANT AVAILABLE NUTRIENT PROFILE

ESSENTIAL MACRONUTRIENTS	N - Total %	**3.03**	NITROGEN - Normal Range: 3.4 - 4.65 %
	P %	**0.32**	PHOSPHORUS - Normal Range: 0.34 - 0.50 %
	K %	**2.26**	POTASSIUM - Normal Range: 3.0 - 4.0 %
	Ca %	**0.764**	CALCIUM - Normal Range: 0.4 - 0.45 %
	Mg %	**0.289**	MAGNESIUM - Normal Range: 0.24 - 0.29 %
	S %	**1.08**	SULPHUR - Normal Range: 0.4 - 0.44 %
ESSENTIAL MICRONUTRIENTS	Fe mg/kg	**97**	IRON - Normal Range: 83 - 167 mg/kg
	Mn mg/kg	**377**	MANGANESE - Normal Range: 54 - 74 mg/kg
	Zn mg/kg	**24.1**	ZINC - Normal Range: 28 - 64 mg/kg
	Cu mg/kg	**<1**	COPPER - Normal Range: 9 - 15 mg/kg
	B mg/kg	**11.4**	BORON - Normal Range: 15 - 20 mg/kg
	Mo mg/kg	**-**	MOLYBDENUM - Normal Range: 0.69 - 1.21 mg/kg
	Cl %	**0.86**	CHLORIDE - Normal Range: 0.20 - 0.30 %
	Na %	**0.264**	SODIUM - Normal Range: 0.1 - 0.2 %

Category	Description
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D.N.T. or " - " denotes "Did not test."

Other Elements (mg/kg)

Nitrate NO_3	Aluminium Al	Nickel Ni	Cobalt Co	Selenium Se	Silicon Si	Iodine I
29.6	**D.N.T.**	**D.N.T.**	**D.N.T.**	**D.N.T.**	**D.N.T.**	**D.N.T.**

Consultant: Stephen Cox
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