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APPENDICES

SUMMARY OF ANALYSES OF VARIANCE (ANOVA)

APPENDIX A

Nitrogen experiments

Table A-1 Analysis of variance for N nutrition on growth characteristics of bush tea during autumn

Sources of variation	Df	Mean squares ^z							
		Plant height (cm)	Number of branches	Fresh shoot mass (g)	Dry shoot mass (g)	Number of leaves	Leaf area (cm ²)	Leaf tissue N (%)	Root tissue N (%)
Model	12	420.0	2127.4	420.1	163.8	47449.8	313628.0	1.5	2.7
Treatment	5	282.9*	2632.2*	663.3*	282.9*	58731.8*	396993.7*	2.7*	6.4*
Nitrogen (linear)	1	2.9 ^{NS}	2740.3 ^{NS}	185.1 ^{NS}	100.3 ^{NS}	60235.6 ^{NS}	30810.9 ^{NS}	1.8 ^{NS}	2.3 ^{NS}
Nitrogen (quadratic)	1	832.0**	9888.0**	2001.4**	872.3**	117117.9**	555503.7**	7.3**	11.3**
Error	35	197.7	2630.0	277.0	169.3	59103.2	17758.7	0.3	0.2

^zF-values significant (*), highly significant (**), or not significant different (NS) at 5% level of probability

Table A-2 Analysis of variance for N nutrition on growth characteristics of bush tea during winter

Sources of variation	Df	Mean squares ^z							
		Plant height (cm)	Number of branches	Fresh shoot mass (g)	Dry shoot mass (g)	Number of leaves	Leaf area (cm ²)	Leaf tissue N (%)	Root tissue N (%)
Model	12	212.9	32.9	614.7	77.6	30722.2	265558.9	3.0	4.2
Treatment	5	126.5*	21.7*	1191.6*	127.9*	51549.6*	529776.3*	7.1*	9.4*
Nitrogen (linear)	1	20.6 ^{NS}	0.1 ^{NS}	193.0 ^{NS}	4.8 ^{NS}	10803.6 ^{NS}	376120.9 ^{NS}	1.8 ^{NS}	1.0 ^{NS}
Nitrogen (quadratic)	1	276.6**	8.6**	2795.7**	529.8**	142793.2**	751016.2**	24.2**	27.7**
Error	35	327.1	15.6	176.1	51.9	18988.8	188930.8	0.3	0.2

^zF-values significant (*), highly significant (**), or not significant different (NS) at 5% level of probability

Table A-3 Analysis of variance for N nutrition on growth characteristics of bush tea during spring

Sources of variation	Df	Mean squares ^z							
		Plant height (cm)	Number of branches	Fresh shoot mass (g)	Dry shoot mass (g)	Number of leaves	Leaf area (cm ²)	Leaf tissue N (%)	Root tissue N (%)
Model	12	235.9	847.6	1040.5	361.1	347470.9	232766.2	0.4	0.3
Treatment	5	150.6*	1342.3*	1967.6*	649.7*	375223.7*	393748.9*	0.9*	0.9*
Nitrogen (linear)	1	13.8 ^{NS}	946.1 ^{NS}	45.9 ^{NS}	109.9 ^{NS}	623007.0 ^{NS}	29448.0 ^{NS}	3.8 ^{NS}	0.2 ^{NS}
Nitrogen (quadratic)	1	656.7**	1100.8**	9425.4**	916.8**	599600.1**	1097252.2**	26.8**	0.3**
Error	35	717.5	374.8	521.6	123.5	185206.5	105837.7	0.2	0.8

^zF-values significant (*), highly significant (**), or not significant different (NS) at 5% level of probability

Table A-4 Analysis of variance for N nutrition on growth characteristics of bush tea during summer

Sources of variation	Df	Mean squares ^z							
		Plant height (cm)	Number of branches	Fresh shoot mass (g)	Dry shoot mass (g)	Number of leaves	Leaf area (cm ²)	Leaf tissue N (%)	Root tissue N (%)
Model	12	270.2	846.6	1040.5	361.8	358952.7	632706.4	0.9	0.7
Treatment	5	195.4*	1347.8*	1967.6*	650.7*	374220.6*	580206.2*	1.8*	1.4*
Nitrogen (linear)	1	11.3 ^{NS}	979.0 ^{NS}	45.9 ^{NS}	108.4 ^{NS}	620498.0 ^{NS}	12140.3 ^{NS}	0.3 ^{NS}	0.2 ^{NS}
Nitrogen (quadratic)	1	893.2**	1088.0**	9425.4**	1918.6**	638395.4**	2639433**	2.3**	2.7**
Error	35	713.4	376.3	521.6	123.6	157835.8	531041.1	0.3	0.3

^zF-values significant (*), highly significant (**), or not significant different (NS) at 5% level of probability

APPENDIX B

Phosphorus experiments

Table B-1 Analysis of variance for P nutrition on growth characteristics of bush tea during autumn

Sources of variation	Df	Mean squares ^z							
		Plant height (cm)	Number of branches	Fresh shoot mass (g)	Dry shoot mass (g)	Number of leaves	Leaf area (cm ²)	Leaf tissue P (%)	Root tissue P (%)
Model	12	510.8	410.9	443.2	368.4	37998.5	74727.9	0.7	0.5
Treatment	5	125.8*	303.0*	711.9*	591.5*	16329.9*	96160.9*	0.4*	0.7*
Phosphorus (linear)	1	28.0 ^{NS}	282.9 ^{NS}	211.8 ^{NS}	89.3 ^{NS}	3726.0 ^{NS}	147871.8 ^{NS}	0.2 ^{NS}	0.2 ^{NS}
Phosphorus (quadratic)	1	179.2**	192.4**	2126.8*	1897.8*	24235.9**	49345.1**	0.3**	0.6**
Error	35	497.2	461.7	275.3	239.3	36196.8	47850.2	0.2	0.2

^zF-values significant (*), highly significant (**), or not significant different (NS) at 5% level of probability

Table B-2 Analysis of variance for P nutrition on growth characteristics of bush tea during winter

Sources of variation	Df	Mean squares ^z							
		Plant height (cm)	Number of branches	Fresh shoot mass (g)	Dry shoot mass (g)	Number of leaves	Leaf area (cm ²)	Leaf tissue N (%)	Root tissue N (%)
Model	12	212.9	78.9	162.6	44.7	22848.9	127676.6	0.5	0.6
Treatment	5	363.9*	86.2*	306.0*	82.2*	36920.3*	84960.0*	0.6*	0.4*
Phosphorus (linear)	1	246.0 ^{NS}	0.9 ^{NS}	26.9 ^{NS}	0.7 ^{NS}	408.9 ^{NS}	264226.6 ^{NS}	0.2 ^{NS}	0.3 ^{NS}
Phosphorus (quadratic)	1	995.7**	339.5**	781.7**	234.1**	147260.6**	327583.8**	0.4**	0.5**
Error	35	131.5	53.9	103.5	23.7	15129.1	51098.1	0.1	0.1

^zF-values significant (*), highly significant (**), or not significant different (NS) at 5% level of probability

Table B-3 Analysis of variance for P nutrition on growth characteristics of bush tea during spring

Sources of variation	Df	Mean squares ^z							
		Plant height (cm)	Number of branches	Fresh shoot mass (g)	Dry shoot mass (g)	Number of leaves	Leaf area (cm ²)	Leaf tissue N (%)	Root tissue N (%)
Model	12	673.6	176.9	422.2	46.3	25910.7	160168.6	0.4	1.5
Treatment	5	560.1*	164.4*	442.4*	32.7*	31560.1*	158459.5*	0.7*	2.9*
Phosphorus (linear)	1	101.5 ^{NS}	2.0 ^{NS}	15.7 ^{NS}	1.6 ^{NS}	48360.5 ^{NS}	3516.8 ^{NS}	0.1 ^{NS}	0.1 ^{NS}
Phosphorus (quadratic)	1	749.1**	531.0**	1932.6**	154.3**	32900.4**	312215.7**	0.3**	27.7**
Error	35	697.2	132.9	258.7	95.7	26428.3	81395.5	0.2	0.2

^zF-values significant (*), highly significant (**), or not significant different (NS) at 5% level of probability

Table B-4 Analysis of variance for P nutrition on growth characteristics of bush tea during summer

Sources of variation	Df	Mean squares ^z							
		Plant height (cm)	Number of branches	Fresh shoot mass (g)	Dry shoot mass (g)	Number of leaves	Leaf area (cm ²)	Leaf tissue P (%)	Root tissue P (%)
Model	12	445.2	138.3	422.2	46.3	49956.9	158081.9	0.3	0.3
Treatment	5	620.3*	114.9*	442.4*	32.7*	60109.8*	186100.2*	0.5*	0.8*
Phosphorus (linear)	1	0.3 ^{NS}	4.5 ^{NS}	15.7 ^{NS}	1.6 ^{NS}	66200.8 ^{NS}	1726.9 ^{NS}	0.2 ^{NS}	0.9 ^{NS}
Phosphorus (quadratic)	1	3074.5**	570.4**	1932.6**	154.3**	193286.5**	371859.9**	1.4**	0.6**
Error	35	587.7	118.1	258.7	95.7	43860.9	85137.2	0.1	0.3

^zF-values significant (*), highly significant (**), or not significant different (NS) at 5% level of probability

APPENDIX C

Potassium experiments

Table C-1 Analysis of variance for K nutrition on growth characteristics of bush tea during autumn

Sources of variation	Df	Mean squares ^z							
		Plant height (cm)	Number of branches	Fresh shoot mass (g)	Dry shoot mass (g)	Number of leaves	Leaf area (cm ²)	Leaf tissue K (%)	Root tissue K (%)
Model	12	384.1	263.3	41.3	24.2	14029.2	47740.3	3.6	3.6
Treatment	5	537.9*	66.4*	41.5*	21.9*	15725.6*	33565.8*	7.4*	7.7*
Potassium (linear)	1	28.0 ^{NS}	14.3 ^{NS}	8.9 ^{NS}	0.6 ^{NS}	2740.3 ^{NS}	26048.8 ^{NS}	1.5 ^{NS}	0.2 ^{NS}
Potassium (quadratic)	1	1974.9**	56.6**	166.5**	94.4**	2530.7**	12543.0**	29.3**	26.7**
Error	35	193.7	343.6	49.0	38.8	8795.7	33494.5	0.7	0.5

^zF-values significant (*), highly significant (**), or not significant different (NS) at 5% level of probability

Table C-2 Analysis of variance for K nutrition on growth characteristics of bush tea during winter

Sources of variation	Df	Mean squares ^z							
		Plant height (cm)	Number of branches	Fresh shoot mass (g)	Dry shoot mass (g)	Number of leaves	Leaf area (cm ²)	Leaf tissue K (%)	Root tissue K (%)
Model	12	1091.2	223.2	41.7	16.8	13130.4	31038.4	1.4	1.5
Treatment	5	1462.4*	191.7*	36.8*	23.7*	17860.5*	54871.5*	3.0*	3.2*
Potassium (linear)	1	751.7 ^{NS}	3.8 ^{NS}	5.2 ^{NS}	4.2 ^{NS}	24.1 ^{NS}	2136.1 ^{NS}	0.6 ^{NS}	0.7 ^{NS}
Potassium (quadratic)	1	3336.9**	370.0**	141.0**	79.8**	20305.8*	139668.8**	9.4**	10.6**
Error	35	687.1	126.9	43.2	17.8	5075.4	42581.7	0.3	0.3

^zF-values significant (*), highly significant (**), or not significant different (NS) at 5% level of probability

Table C-3 Analysis of variance for K nutrition on growth characteristics of bush tea during spring

Sources of variation	Df	Mean squares ^z							
		Plant height (cm)	Number of branches	Fresh shoot mass (g)	Dry shoot mass (g)	Number of leaves	Leaf area (cm ²)	Leaf tissue K (%)	Root tissue N (%)
Model	12	1091.2	223.16	41.3	24.2	11215.9	47740.3	0.3	0.4
Treatment	5	1462.4*	191.7*	41.5*	21.9*	16751.4*	33565.8*	0.7*	0.9*
Potassium (linear)	1	751.75 ^{NS}	3.8 ^{NS}	8.9 ^{NS}	0.6 ^{NS}	23058.8 ^{NS}	26048.8 ^{NS}	0.3 ^{NS}	0.1 ^{NS}
Potassium (quadratic)	1	3336.9**	370.0**	166.5**	94.4**	19674.7**	12543.0**	3.2**	4.2**
Error	35	687.1	126.8	49.0	38.8	6784.7	33494.5	0.2	0.2

^zF-values significant (*), highly significant (**), or not significant different (NS) at 5% level of probability

Table C-4 Analysis of variance for K nutrition on growth characteristics of bush tea during summer

Sources of variation	Df	Mean squares ^z							
		Plant height (cm)	Number of branches	Fresh shoot mass (g)	Dry shoot mass (g)	Number of leaves	Leaf area (cm ²)	Leaf tissue K (%)	Root tissue K (%)
Model	12	721.2	208.5	540.3	405.6	7293.1	116943.3	1.2	1.1
Treatment	5	928.9*	212.3*	688.94*	416.6*	4971.9*	136926.6*	2.5*	2.5*
Potassium (linear)	1	2.0 ^{NS}	1.1 ^{NS}	6.1 ^{NS}	27.7 ^{NS}	8811.3 ^{NS}	67172.1 ^{NS}	0.2 ^{NS}	0.2 ^{NS}
Potassium (quadratic)	1	4092.0**	380.0**	32.81**	969.6**	13172.0**	476666.3**	2.7**	2.4**
Error	35	369.6	109.9	484.2	524.0	7615.3	59404.7	0.5	0.3

^zF-values significant (*), highly significant (**) or not significant different (NS) at 5% level of probability

APPENDIX D

Seasonal Variation

Table D-1 Analysis of variance for N nutrition on seasonal variation of leaf concentration of polyphenols of bush tea

Sources of variation	Df	Mean squares ^z			
		Concentration of total polyphenols (mg·g ⁻¹)			
		Autumn	Winter	Spring	Summer
Model	12	116.7	165.4	394.9	613.9
Treatment	5	184.6**	197.2**	767.6**	1193.7**
Nitrogen (linear)	1	0.5 ^{NS}	4.9 ^{NS}	4.3 ^{NS}	9.1 ^{NS}
Nitrogen (quadratic)	1	919.7**	835.7**	3762.6**	5378.4**
Error	35	172.4	77.3	107.4	241.8

^zF-values significant (*), highly significant (**), or not significant different (NS) at 5% level of probability

Table D-2 Analysis of variance for P nutrition on seasonal variation of leaf concentration of polyphenols of bush tea

Sources of variation	Df	Mean squares ^z			
		Concentration of total polyphenols (mg·g ⁻¹)			
		Autumn	Winter	Spring	Summer
Model	12	643.6	580.8	312.7	441.1
Treatment	5	1383.7*	1133.3*	588.9*	881.9*
Phosphorus (linear)	1	554.5 ^{NS}	2.0 ^{NS}	0.5 ^{NS}	273.5 ^{NS}
Phosphorus (quadratic)	1	3442.1**	4843.8**	1860.1**	2767.2**
Error	35	211.4	278.3	300.7	236.3

^zF-values significant (*), highly significant (**), or not significant different (NS) at 5% level of probability

Table D-3 Analysis of variance for K nutrition on seasonal variation of leaf concentration of polyphenols of bush tea

Sources of variation	Df	Mean squares ^z			
		Concentration of total polyphenols (mg·g ⁻¹)			
		Autumn	Winter	Spring	Summer
Model	12	720.3	1244.9	232.5	742.1
Treatment	5	1581.5**	2437.9**	1085.7**	1631.3**
Potassium (linear)	1	1024.5 ^{NS}	1837.1 ^{NS}	139.9 ^{NS}	276.8 ^{NS}
Potassium (quadratic)	1	4130.4**	6236.2**	4326.2**	6174.0**
Error	35	171.4	238.9	232.6	370.9

^zF-values significant (*), highly significant (**) or not significant different (NS) at 5% level of probability

APPENDIX E

FACTORIAL EXPERIMENT

Table E-1 Analysis of variance for N x Px K nutrition on growth and chemical composition of bush tea during autumn

Sources of variation	Df	Means squares ^z										
		Fresh shoot mass (g)	Dry shoot mass (g)	Number of leaves	Leaf area (cm ²)	Total polyphenols (mg·g ⁻¹)	Leaf tissue N (%)	Root tissue N (%)	Leaf tissue P (%)	Root tissue P (%)	Leaf tissue K (%)	Root tissue K (%)
Model	29	112.3	85.7	7622.0	636910.4	835.9	0.3	0.4	0.6	0.1	0.4	2.3
Treatment	26	122.0*	93.7*	70033.3*	883862.2*	806.3*	0.4*	0.3*	0.4*	0.7*	0.5*	2.2*
Error	78	12.5	18.9	2123.1	356871.1	275.8	0.1	0.2	0.2	0.6	0.4	2.0

^zF-values significant (*), highly significant (**) or not significant different (NS) at 5% level of probability

Table E-2 Analysis of variance for N x Px K nutrition on growth and chemical composition of bush tea during winter

Sources of variation	Df	Means squaresz										
		Fresh shoot mass (g)	Dry shoot mass (g)	Number of leaves	Leaf area (cm ²)	Total polyphenols (mg·g ⁻¹)	Leaf tissue N (%)	Root tissue N (%)	Leaf tissue P (%)	Root tissue P (%)	Leaf tissue K (%)	Root tissue K (%)
Model	29	55.8	206.0	208461.8	15194.3	281.3	0.8	1.0	0.1	0.1	0.5	2.3
Treatment	26	46.0*	150.6*	22745.1*	16611.2*	303.3*	2.5*	1.1*	0.4*	0.5*	0.4*	3.3*
Error	78	24.3	56..5	116690.9	9810.9	75.2	0.4	0.2	0.2	0.4	0.2	2.3

²F-values significant (*), highly significant (**) or not significant different (NS) at 5% level of probability

Table E-3 Analysis of variance for N x P x K nutrition on growth and chemical composition of bush tea during spring

Sources of variation	Df	Means squares ^z										
		Fresh shoot mass (g)	Dry shoot mass (g)	Number of leaves	Leaf area (cm ²)	Total polyphenols (mg·g ⁻¹)	Leaf tissue N (%)	Root tissue N (%)	Leaf tissue P (%)	Root tissue P (%)	Leaf tissue K (%)	Root tissue K (%)
Model	29	91.4	127.4	140912.0	1599.4	95.4	0.6	0.8	0.2	0.4	0.5	0.4
Treatment	26	101.3*	141.4*	150747.6*	17732.4*	92.7*	0.7*	0.9*	0.4*	0.3*	0.6*	0.5*
Error	78	7.2	73.7	63306.3	27350.8	69.3	0.3	0.2	0.1	0.1	0.1	1.2

^zF-values significant (*), highly significant (**) or not significant different (NS) at 5% level of probability

Table E-4 Analysis of variance for N x P x K nutrition on growth and chemical composition of bush tea during summer

Sources of variation	Df	Means squares ^z										
		Fresh shoot mass (g)	Dry shoot mass (g)	Number of leaves	Leaf area (cm ²)	Total polyphenols (mg·g ⁻¹)	Leaf tissue N (%)	Root tissue N (%)	Leaf tissue P (%)	Root tissue P (%)	Leaf tissue K (%)	Root tissue K (%)
Model	29	119.9	155.2	1145.5	42976.5	247.8	0.8	0.7	0.4	0.1	0.8	0.7
Treatment	26	133.5*	171.9*	1266.9*	46989.8*	255.3*	0.3*	0.3*	0.1*	0.2*	0.9*	0.8*
Error	78		50.7	92.6	21748.9	166.1	0.4	0.8	0.1	0.1	0.2	0.2

^zF-values significant (*), highly significant (**) or not significant different (NS) at 5% level of probability