NORTHERN TERRITORY

DEPARTMENT OF PRIMARY INDUSTRY AND FISHERIES

NUTRIENTS IN PASTURE GRASSES IN THE TOP END OF THE NORTHERN TERRITORY

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CONTENTS

SUMMARY

Monthly tabulated data is presented for the “normal” range of nutrient concentrations determined in pasture grasses in the Top End of the Northern Territory.

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INTRODUCTION

This bulletin summarises the nutrient concentrations recorded in pasture species and fodder crops in the Top End of the Northern Territory. For the purposes of this bulletin, the Top End is regarded as being from Daly Waters north.

Most of the data presented was obtained from research trials conducted by Pastures Section staff. Some of the data was obtained from research trials conducted by other Sections in the Department including Animal Production and Crops, while a minor component was obtained from published papers on trials conducted by CSIRO.

The nutrient concentrations are presented as a range "normally" recorded in plant tops for each species during each month of the year.

There are a number of factors which influence the nutrient concentrations found in plants. These factors are biology, climate, soil, topography and management.

Effects of Plant Biology on Nutrient Concentrations

The factors involved in plant biology are species, plant type (grass vs legume or annual vs perennial), plant component (stem vs leaf) stage of growth (vegetative vs reproductive) and maturity (early vs late).

Plant species can and do differ in the levels of nutrients they require in their tissues for growth, and the levels they accumulate in tissues. Tropical grasses generally contain lower levels of plant nutrients, particularly nitrogen (Fisher 1971, Norman and Wetselaar 1960) than do legumes.

Grasses have a similar anatomy, and generally their nutrient concentrations are similar at the same stage of the wet season (Arndt and Norman 1959, Fisher 1971), with some slight differences caused by early or late maturity, i.e. early flowering or late flowering. Nutrient concentrations can be high in the early part of the wet season, September-December (Hendy 1971, Norman 1963). Grasses depend on the soil or applied fertilisers for the nutrients they contain.

Annual plants have similar nutrient concentrations to perennial plants during the wet (growing) season. Towards the late wet season and into the dry season the annual plants channel their nutrients into their seed, which can lead to a rapid decrease in plant nutrient concentrations (Arndt and Norman 1959, Fisher 1971). Some of the perennial plants store nutrients in their root systems. This allows them to produce a rapid flush of growth early in the next wet season when the annual plants are re-establishing from seed (Hendy 1971).

Plant component has an important bearing on nutrient concentration. Leaves contain higher levels of most nutrients than do stems. The tables for a number of the grasses in this bulletin illustrate this. Grazing animals will generally graze plant leaf in preference to the lower quality stem. While the nutrient concentrations in whole tops gives a guide to the quality of feed on offer, the grazing animal can generally select material containing higher levels of nutrients.

Stage of growth is critical. Plant nutrient concentrations are high during the early vegetative phase of growth (Fisher 1973), but decline as the plant ages and begins to flower and set seed (Arndt and Norman 1959). Nutrients are withdrawn from the leaves and stem and stored in the developing seed. At the same time, the plants shed some of their older leaves (Wesley-Smith et al. 1982).

Maturity influences the nutrient concentration towards the end of the wet season and early in the dry season. There are differences between species and within species in times of maturity. The later maturing species or cultivars will have higher nutrient concentrations later in the wet season.

Effects of Climate on Nutrient Concentrations

The principal climatic factor which influences nutrient concentrations is rainfall and the main effects are due to timing of the rainfall at the beginning and the end of the wet season.

The amount and duration of rainfall decreases over the Top End from over 1,600 mm in the north to 600 mm in the south at Daly Waters. Because of the longer wet season in the north, the plants there can grow and maintain their nutrient levels for longer into the dry season, and active growth commences earlier in the wet season compared with the south.

Rain early in the wet season (McCown and McLean 1983) or late in the wet season will allow plants to have nutrient concentrations towards the higher end of the "normal" range. In a dry start or finish to the wet season, the nutrient concentrations will be towards the lower end of the scale.

Effects of Soil Type on Nutrient Concentrations

Most of the soils in the Top End have low available levels of most plant nutrients, and nutrient deficiencies have been confirmed on a number of soils (Calder and Day 1982, Calder et al. 1983). Some soils have adequate levels of some nutrients including the grey clay floodplain soils which contain adequate levels of phosphorus, sulfur and potassium and the Tippera soils which have adequate potassium levels. There can be an interaction between soil type and plant species which will affect plant nutrient concentrations. Some plants can extract nutrients at lower available levels. Many pasture plants can grow on a range of soil types and contain a range of nutrient concentrations depending on the soil in which they are growing.

Effect of Topography on Nutrient Concentrations

The effects of topography are mainly related to moisture. On one end of the scale, rocky ridges with shallow soil dry out quickly after the wet season, and the plants growing in that situation mature early. The nutrient concentrations would be similar to those in a lower rainfall area. The other end of the scale are the seasonally inundated coastal plains which are flooded and do not dry out until late in the dry

season. In this situation the plants continue to grow and maintain their nutrient concentrations through the dry season.

Between these two extremes are a range of situations of varying length of growing season where the length of the growing season increases in low-lying waterlogged or seasonally flooded areas, or areas where the water table remains close to the soil surface.

Effects of Management on Nutrient Concentrations

The management factors which can influence nutrient concentrations are sowing date (month vs year) fertilisation practices, grazing or cutting management and irrigation practices.

The effect on sowing date on plant nutrient concentrations is illustrated by Fisher (1969), where there were consistent differences in nitrogen content of Townsville stylo (*Stylosanthes humilis*) stems and leaves between a November and a December sowing.

This effect is also reflected in the comparison of first year stands with second and older year stands of pasture species where at the equivalent stage of the wet season the first year stands consistently have higher nutrient contents. This is related to the maturity of the plants as they generally require the same amount of time to reach maturity, and the sowing date can be from one to three months after the start of the wet season when established swards commence their growing season.

Fertilisation practice is the most important influence on the nutrient content of most tropical pasture species. This is because of the low soil nutrient status of most Top End soils as mentioned previously. Most soils are low in phosphorus and sulphur, and all pasture plants will contain low levels of these elements unless these fertilisers have been applied (Norman 1959). Nitrogen is the main limitation to yield for grasses, and plant levels will be lower unless nitrogen fertiliser has been applied recently (Miller and Nobbs 1976, Norman 1960, Norman and Wetselaar 1960). In the tables, the higher end of the ranges generally represents well fertilised pastures. This is not the case with native and naturalised pasture species, where nutrient concentrations are generally low (Norman 1963). For hymenachne (*Hymenachne acutigluma*) and para grass (*Brachiaria mutica*) on floodplains (Calder 1981) which are not fertilised, the high levels of nutrients in plants are related to soil (more fertile clays) and topographical factors (flooded areas).

Grazing, cutting or burning can increase or decrease plant nutrient concentrations. During the growing season, or while there is moisture in the soil, these practices will lead to young regrowth which contains higher nutrient concentrations (Falvey 1977, Hendy 1971, Norman 1960). During the dry season, when the pastures are not growing and soil moisture reserves have been depleted, these practices will lead to lower plant nutrient concentrations (Woods 1970). Grazing animals will eat the leaf material leaving the lower quality stem (McCown and McLean 1983).

Irrigation will ensure that a pasture sward has a longer growing season equivalent to a higher rainfall area. Plant nutrient levels will be maintained at a higher level than would be expected. The nutrient concentrations presented in this bulletin do not contain data from irrigated pastures, as very little research work has been done on this aspect of pasture production in the Top End.

Significance of the Plant Nutrient Levels

The nutrient concentrations in the pasture plants are only significant if they are so low as to affect pasture yield or to be deficient for animal production. The critical level in plants varies with stage of growth, and low levels in plants are generally used to diagnose reasons for poor growth or to confirm deficiency symptoms. The levels of nutrients required in feed for growing and lactating cattle are shown in Table 1. Nitrogen percentage is usually expressed as Crude protein (CP) % (N% x 6.25), which corresponds to 11.1 and 9.2% CP for growing cattle and cows respectively.

A comparison of the levels in Table 1 with those in the nutrient concentration tables in this bulletin gives an indication of when the various grasses contain adequate nutrient levels for cattle.

Table 1: Feed nutrient requirements for cattle

Nutrient	N%	P%	K%	S%	Ca%	Mg%	Na%	Cu ppm	Zn ppm
Growing Cattle	1.8	.13	.5	.15	.19	.19	.08	6	12
Lactating Cattle	1.5	.18	.8	.15	.24	.19	.08	7	14

Grazing animals can generally select better diet than that indicated by a grab sample of plant tops, i.e. by selecting leaves which invariably have higher nutrient levels than stems or by selecting plants with higher nutrient levels than others i.e. legumes in the dry season generally have higher levels of nutrients than grasses.

The Future

This is the third edition of this publication. A further edition containing more information on a wider range of species may be produced in the future.

Another publication which presents ranges for feed composition factors such as digestibility, dry matter, crude fibre, ash, ether extract and non-fibre extract for a similar range of pasture species will also be produced.

Not all of the genera and species listed are recommended or are available as pasture plants in the Northern Territory. Some are recommended as pasture species (Eggington and Cameron 1992), some are no longer recommended, e.g. plicatulum, while others are showing promise as pasture cultivars and may be released in the future. Also included is a range of native pasture plants which are grazed to varying extent by livestock at various times of the year.

There is also a question of quantity or availability to consider. While nutrient levels may appear more than adequate in pastures in the early wet season period, the amount of pasture available from perennial grasses and annuals may be so low as to limit animal growth.

REFERENCES

The references are presented in three parts. Part A contains those referred to in the text. Part B contains references used to provide information presented in the Nutrient Concentration Tables, but not used in the text. Part C contains references which provide information on pasture species in the Top End of the NT and northern WA, but not in a form which could be extracted for use in the Nutrient Concentration Tables.

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NUTRIENT CONCENTRATION TABLES

Format and Codes Used

Species Alphabetically listed by genus and species with genus, with one page per species/plant component.

Where there is a limited number of entries for a species, they are listed in line form at the end.

Common Name provided where applicable.

Cultivar name provided where applicable.

Plant Part The part of the plant samples, generally whole tops but also may be leaf, regrowth, stem or leaves and twigs. The term `whole tops' indicates everything above about 5 cm from the ground.

Nutrient Concentrations Elements presented as a percentage (%) of dry matter are nitrogen (N), phosphorus (P), potassium (K), sulphur (S), calcium (Ca), magnesium (Mg), sodium (Na) and chlorine (Cl).

Elements presented as parts per million (ppm) of dry matter are copper (Cu), zinc (Zn), manganese (Mn), iron (Fe), molybdenum (Mo) and boron (B).

Region This shows where plants have been sampled to analyse for nutrient concentration, the codes used for the regions are:

DN - Darwin area including Berriman Agricultural Research Centre
FL - Floodplains, seasonally inundated areas including Coastal Plains Research Station, Tortilla Flats Research Farm.
CU - Northern Coastal Upland areas including Coastal Plains Research Station, Beatrice Hills Research Station
AR - Adelaide River upland areas including Tortilla Flats Research Farm and Mount Bundey Station.
DD - Douglas Daly area including Douglas Daly Research Farm and Tipperary Station.
KN - Katherine area including Katherine Experimental Station
VR - Victoria River area, including Victoria River Research Station.
DW - Daly Waters area

Comments Included in this are records of minor element and other plant parts, i.e. leaf, regrowth, stem where there is only one month's records.

Crude protein percentages can be calculated by multiplying the nitrogen percentage by 6.25 (i.e. N x 6.25).

SPECIES: *Alloteropsis semialata*
COMMON NAME: Cockatoo grass
PLANT PART: Tops

MONTH	NUTRIENT CONCENTRATION RANGE								
	N	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep									
Oct	0.9 - 2.3	.10 - .23							
Nov	1.1 - 1.7	.10 - .12	1.6 - 2.0	.09 - .10	.1 - .2	.12 - .16	<.01	5 - 7	13
Dec	1.1 - 1.2	.11 - .13							
Jan	0.9	.06	0.7	.07	.2	.22		5	5
Feb	1.0	.03							
Mar	0.7 - 1.6	.06 - .09	1.7	.11	.2	.16	<.01	7	9
Apr	0.8	.07							
May	0.6	.07							
Jun	0.7	.02	0.8	.07	.2	.27	.02	3	6
Jul	0								
Aug									

REGION: AR, CU, VR

SPECIES: *Alloteropsis semialata*
COMMON NAME: Cockatoo grass
PLANT PART: Leaf

MONTH	NUTRIENT CONCENTRATION RANGE								
	N	P	K	S	Ca	Mg	Na	Cu	Zn
Sep									
Oct	2.3	.23							
Nov	1.4	.11							
Dec	1.2	.13							
Jan	1.0	.14							
Feb	1.0	.03							
Mar	1.0	.06							
Apr	0.7	.07							
May	0.8	.07							
Jun									
Jul									
Aug									

REGION: AR, CU

SPECIES: *Andropogon gayanus*
COMMON NAME: Gamba grass
CULTIVAR: Kent
PLANT PART: Tops

MONTH	NUTRIENT CONCENTRATION RANGE								
	N	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.2 - 0.6	.02 - .07	0.2 - 0.9	.02 - .05	.2 - .5	.14 - .16	<.01-.02	2 - 7	5 - 17
Oct	0.3 - 0.9	.03 - .10	0.1 - 0.9	.02 - .07	.2 - .5	.16 - .20	.01	2 - 4	9 - 19
Nov	1.1 - 2.7	.06 - .23	0.4 - 1.7	.03 - .11	.2 - .4	.07 - .41	<.01-.01	4 - 14	11 - 34
Dec	0.7 - 2.6	.09 - .23	0.3 - 1.8	.06 - .15	.2 - .4	.17 - .31	<.01-.01	2 - 16	9 - 22
Jan	0.9 - 1.7	.11 - .24	0.6 - 1.8	.07 - .14	.2 - .4	.18 - .38	<.01-.01	4 - 9	10 - 33
Feb	0.8 - 1.5	.11 - .24	1.0 - 2.2	.05 - .10	.3 - .4	.12 - .36	<.01-.02	2 - 8	11 - 40
Mar	0.4 - 1.2	.09 - .16	1.0 - 1.6	.04 - .10	.3 - .6	.16 - .44	<.01-.02	2 - 9	11 - 35
Apr	0.4 - 1.2	.09 - .16	0.7 - 1.6	.05 - .10	.3 - .6	.15 - .38	<.01-.01	2 - 6	13 - 35
May	0.2 - 0.9	.05 - .14	0.4 - 1.5	.04 - .10	.2 - .4	.17 - .42	<.01-.01	2 - 6	10 - 31
Jun	0.2 - 0.9	.04 - .12	0.4 - 1.2	.03 - .06	.2 - .4	.10 - .39	<.01-.02	2 - 5	8 - 34
Jul	0.2 - 0.9	.03 - .09	0.3 - 1.1	.03 - .06	.1 - .4	.10 - .34	<.01-.01	2 - 5	11 - 24
Aug	0.2 - 0.6	.02 - .04	0.3 - 0.9	.03 - .06	.3 - .5	.08 - .28	<.01-.02	2 - 4	17 - 20

REGION: AR, CU, DD, DN

SPECIES: *Andropogon gayanus*
COMMON NAME: Gamba grass
CULTIVAR: Kent
PLANT PART: Tops

MONTH	NUTRIENT CONCENTRATION RANGE				
	B	**Fe**	**Mn**	**Mo**	**Cl**
Sep					
Oct					
Nov			152 - 226		
Dec	6	81			
Jan	5 - 6	60 - 310			
Feb					
Mar					
Apr	4 - 8	68 - 108	215 - 225		
May					
Jun	10 - 16		117 - 376		
Jul					
Aug			310		

REGION: AR, CU, DD, DN

SPECIES: *Andropogon gayanus*
COMMON NAME: Gamba grass
CULTIVAR: Kent
PLANT PART: Stem

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep									
Oct									
Nov									
Dec									
Jan									
Feb									
Mar									
Apr									
May									
Jun	0.1	.01	0.7	.04	.2		.01	2	33
Jul									
Aug									

REGION: DN

SPECIES: *Andropogon gayanus*
COMMON NAME: Gamba grass
CULTIVAR: Kent
PLANT PART: Leaf/Regrowth

MONTH	NUTRIENT CONCENTRATION RANGE								
	N	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.4 - 1.6	.06 - .10	0.3 - 1.1	.05 - .11	.4		.01	2	6
Oct	0.7 - 2.9	.05 - .30	0.8 - 1.4	.05 - .12	.3 - .5	.15 - .40	.01 - .02	2 - 5	8 - 18
Nov	2.0	.18							
Dec	1.9	.20	1.4	.11					
Jan	2.1	.07	0.9	.05					
Feb	1.4 - 1.7	.09 - .12	0.9 - 1.7	.12					
Mar	0.9 - 3.2	.09 - .27	1.0 - 1.9	.06 - .19	.2 - .3	.21	<.01 - .01	10 - 13	41
Apr	0.8 - 1.5	.16 - .19	1.1 - 1.7	.03 - .20					
May	1.5 - 1.6	.13 - .15	0.7 - 1.2	.05 - .12					
Jun	0.7 - 1.1		0.9 - 1.3						
Jul	0.4 - 1.7	.04 - .16	0.5 - 1.6	.06 - .13	.3 - .7	.31 - .42	.01 - .03	4 - 5	18
Aug	0.5 - 1.3	.07 - .13	0.5 - 1.1	.05- .10	.4	.35		5	24

REGION: AR, CU, DD, DN

SPECIES: *Aristida* spp *(contorta(A.c), inaequiglumis(A.i), latifolia(A.l))*
COMMON NAME: Wire grasses, Bunched Kerosene grass *(A.c)*, Feathertop threeawn *(A.i)*, Feathertop wiregrass *(A.l)*
PLANT PART: Tops

MONTH	NUTRIENT CONCENTRATION RANGE								
	N	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.3 - 0.8	.01 - .06		.10 - .11	.1 - .4				
Oct	0.3 - 1.3	.01 - .05	0.5 -0 .9	.06 - .08	.1 - .5	.06	.01 - .02	2 - 4	5 - 10
Nov	1.6 - 1.5	.04 - .09	0.7	.08 - .19	.2 - .3	.10	.01	5	17
Dec	1.0	.10							
Jan	0.7	.04	0.5	.10	.2	.06	<.01	5	15
Feb	0.4 - 0.9	.04 - .07							
Mar	0.5 - 1.4	.03 - .10	0.7	.10	.2	.15	<.01	6	46
Apr	0.5 - 1.0	.05 - .11	0.7	.12	.1	.15	.01	5	26 - 41
May	0.3 - 1.2	.02 - .09							
Jun	0.5	.03 - .05							
Jul	0.4 - 0.5	.02 - .04	0.3	.05	.1	.10	.02	3	13
Aug	0.2 - 0.7	.01 - .07	0.7	.12	.2	.12	<.01	5	31

REGION: CU, DD, VR

SPECIES: *Astrebla* spp (*elymoides(A.e), pectinata(A.p), squarrosa(A.s))*
COMMON NAME: Mitchell grasses, Mitchell grass *(A.e)*, Barley Mitchell *(A.p)*, Bull Mitchell *(A.s)*
PLANT PART: Tops

MONTH	NUTRIENT CONCENTRATION RANGE								
	N	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep									
Oct	0.4 - 0.7	.04 - .10			.2				
Nov	0.4	.03							
Dec	1.4	.12							
Jan									
Feb									
Mar	1.0	.09	1.2	.20	.4	.17	<.01		11
Apr	1.5	.17			.3				
May	0.6 - 1.1	.03 - .10							
Jun	0.4 - 1.1	.03 - .10							
Jul	0.5 - 1.0	.04 - .10	0.9 - 1.0	.28 - .38	.3 - .8	.11 - .14	<.01 - .01		11 - 23
Aug									

REGION: DW, VR

SPECIES: *Bothriochloa bladhii*
COMMON NAME: Forest bluegrass
PLANT PART: Tops

MONTH	NUTRIENT CONCENTRATION RANGE								
	N	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.4 - 1.1	.03 - .12	0.9	.13	.1	.15	.02	2	34
Oct	1.6	.16	1.3	.14	.3	.47	<.01	9	33
Nov	0.8 - 1.4	.07 - .10	1.0 - 1.6	.09 - .12	.2 - .3	.17 - .19	<.01 - .01	4 - 8	23
Dec	0.9	.10	1.4	.20	.4		<.01	9	47
Jan	0.6 - 1.1	.08 - .13	1.5 - 2.2	.10 - .12	.2 - .3	.13	<.01 - .01	3 - 5	24 - 31
Feb	07- 1.3	.08 - .18	1.4 - 1.8	.11 - .20	.2 - .5	.11 - .26	<.01	4 - 7	23 - 37
Mar	0.6 - 1.2	.06 - .18	1.3 - 1.8	.09 - .15	.1 - .3	.13 - .23	<.01 - .02	3 - 4	20 - 36
Apr	0.7 - 1.2	.10 - .16	1.2 - 1.8	.10 - .18	.2 - .4	.10 - .24	<.01 - .02	4	28 - 36
May	1.0	.10							
Jun	0.5 - 0.7	.04 - .07	0.6 - 1.4	.10 - .15	.3	.17	<.01	2 - 3	24
Jul	0.4 - 0.9	.13	0.8	.15	.2	.41	<.01	9	50
Aug	0.4	.03	0.9	.12	.2	.17	.03	3	54

REGION: AR, CU, DN, DD

SPECIES: *Bothriochloa bladhii*
COMMON NAME: Forest bluegrass
PLANT PART: Leaf

MONTH	NUTRIENT CONCENTRATION RANGE								
	N	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	1.1	.12							
Oct									
Nov									
Dec									
Jan	1.1	.13							
Feb									
Mar									
Apr									
May	1.0	.13							
Jun									
Jul	0.4	.10							
Aug									

REGION: AR

SPECIES: *Bothriochloa pertusa*
COMMON NAME: Indian bluegrass
CULTIVAR: Bowen, naturalised
PLANT PART: Tops

MONTH	NUTRIENT CONCENTRATION RANGE								
	N	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.3 - 0.6	.05 - .11	0.7 - 0.9	.07 - .14	.3 - .5	.12 - .30	<.01	2 - 4	16 - 32
Oct	0.3 - 0.7	.04 - .09	0.3 - 0.6	.08 - .16	.4 - .6	.17 - .30	.01 - .03	2 - 5	32
Nov	0.4 - 2.1	.08 - .25	0.4 - 1.8	.05 - .18	.2 - .6	.14 - .28	<.01 - .02	3 - 11	20 - 30
Dec	0.8 - 1.2	.17 - .29	1.4 - 1.5	.10 - .20	.3 - .7	.20 - .32	<.01 - .02	4 - 8	27 - 35
Jan	0.4 - 1.6	.11 - .29	0.8 - 2.4	.12 - .17	.3 - .6	.15 - .26	<.01 - .01	4 - 8	31 - 39
Feb	0.6 - 1.3	.08 - .23	0.9 - 2.0	.10 - .15	.3 - .4	.14 - .26	<.01 - .03	3 - 7	21 - 36
Mar	0.7 - 1.1	.07 - .21	0.9 - 1.7	.11 - .18	.3 - .8	.09 - .17	<.01 - .01	2 - 6	12 - 34
Apr	0.7 - 1.0	.10 - .16	0.9 - 1.4	.09 - .19	.3 - .7	.14 - .22	<.01 - .01	2 - 6	13 - 34
May	0.5 - 0.9	.09 - .16	0.7 - 1.1	.07 - .11	.2 - .7	.16 - .18	<.01 - .01	2 - 5	12 - 35
Jun	0.3 - 0.9	.03 - .11	0.6 - 1.0	.09 - .17	.3 - .6	.13 - .27	<.01 - .04	2 - 4	12 - 34
Jul	0.3 - 0.7	.02 - .10	0.8 - 1.0	.08 - .15	.3 - .6	.13 - .27	<.01 - .04	2 - 3	23 - 31
Aug	0.2 - 0.7	.03 - .09	0.6 - 1.0	.06 - .11	.3 - .6	.14 - .31	<.01 - .03	2 - 5	13 - 34

REGION: CU, DD, DN, KN
COMMENTS: Mn: Nov 166; Feb 111; Apr 142 - 180; Aug 116
Mo: Feb .4; Apr 1.6

SPECIES: *Bothriochloa pertusa*
COMMON NAME: Indian bluegrass
CULTIVAR: Bowen, naturalised
PLANT PART: Regrowth

MONTH	NUTRIENT CONCENTRATION RANGE								
	N	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.4	.10	1.1	.08	.2	.13	.02	2	35
Oct									
Nov									
Dec									
Jan									
Feb									
Mar									
Apr									
May									
Jun									
Jul									
Aug									

REGION: DN

SPECIES: *Brachiaria decumbens* (syn *B. brizantha, Urochloa d*)
COMMON NAME: Signal grass
CULTIVAR: Basilisk
PLANT PART: Tops

MONTH	NUTRIENT CONCENTRATION RANGE								
	N	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.2 - 0.8	.02 - .10	0.4 - 1.8	.03 - .07	.2 - .3	.15 - .19	<.01 - .02	2	8 - 14
Oct	0.4 - 3.6	.05 - .34	0.3 - 1.9	.06 - .07	.2 - .3	.16 - .20	<.01 - .01	1 - 3	9 - 21
Nov	0.9 - 3.0	.08 - .24	0.4 - 2.6	.06 - .16	.3 - .4	.18 - .25	<.01 - .01	2 - 10	10 - 30
Dec	0.7 - 2.5	.11 - .26	0.9 - 2.6	.08 - .20	.2 - .5	.24 - .34	<.01 - .01	2 - 10	11 - 46
Jan	0.7 - 2.0	.12 - .24	1.2 - 2.7	.09 - .16	.2 - .3	.21 - .42	<.01 - .01	2 - 9	14 - 36
Feb	0.6 - 2.2	.06 - .25	1.0 - 1.9	.07 - .18	.2 - .4	.18 - .40	<.01 - .03	3 - 12	21 - 45
Mar	0.6 - 2.0	.07 - .25	1.1 - 2.2	.06 - .16	.2 - .4	.19 - .40	<.01 - .04	2 - 6	15 - 34
Apr	0.5 - 0.2	.08 - .20	0.9 - 2.1	.07 - .16	.2 - .3	.19 - .40	<.01 - .01	2 - 7	14 - 43
May	0.5 - 1.7	.06 - .19	0.3 - 1.8	.07 - .14	.2 - .6	.20 - .65	<.01 - .01	2 - 10	12 - 37
Jun	0.3 - 1.1	.03 - .13	0.3 - 1.5	.06 - .10	.2 - .3	.24 - .49	<.01 - .02	1 - 4	12 - 28
Jul	0.3 - 1.0	.04 - .11	0.4 - 1.4	.05 - .07	.2 - .4	.17 - .40	<.01	2 - 4	9 - 22
Aug	0.3 - 1.1	.04 - .10	0.5 - 2.1	.04 - .07	.3	.15 - .31	<.01 - .02	1 - 3	7 - 13

REGION: AR, CU, DN, DD, KN

SPECIES: *Brachiaria decumbens* (syn *B. brizantha, Urochloa d*)
COMMON NAME: Signal grass
CULTIVAR: Basilisk
PLANT PART: Tops

MONTH	NUTRIENT CONCENTRATION RANGE				
	B	**Fe**	**Mn**	**Mo**	**Cl**
Sep					
Oct					
Nov					
Dec	4	58 - 288			
Jan	4 - 7	94 - 190			
Feb				.2 - 2.1	
Mar				<.2	
Apr	3 - 8	62 - 261			
May				.2 - 1.5	
Jun					
Jul					
Aug					

REGION: CU, DD, KN

SPECIES: *Brachiaria decumbens* (syn *B. brizantha, Urochloa d.*)
COMMON NAME: Signal grass
CULTIVAR: Basilisk
PLANT PART: Leaf/regrowth

MONTH	NUTRIENT CONCENTRATION RANGE								
	N	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	1.3 - 2.4	.09 - .17	1.7 - 3.3	.12 - .14	.7	.30	.01	5	16
Oct	2.1 - 3.6	.12 - .34	1.5	.15					
Nov	3.0	.24							
Dec	2.4	.24	2.7	.10					
Jan	1.6	.12	2.6	.06					
Feb	1.3 - 1.9	.12 - .21	1.7 - 2.3	.13 - .15					
Mar	1.2 - 1.8	.12 - .24	1.6	.08 - .14					
Apr	1.2 - 2.0	.17 - .20	1.6 - 1.7	.05 - .08					
May	1.0 - 1.6	.15 - .18	1.4 - 1.8	.09 - .13					
Jun									
Jul	0.9 - 1.3	.07 - .12	1.3 - 1.9	.09					
Aug	1.1 - 1.2	.08 - .12	1.4	.07					

REGION: AR, CU

SPECIES: *Brachiaria humidicola (*syn *Urochloa h.)*
COMMON NAME: Koronivia grass, humidicola
CULTIVAR: Tully
PLANT PART: Tops

MONTH	NUTRIENT CONCENTRATION RANGE								
	N	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.1 - 0.7	.02 - .09	0.2 - 1.6	.02 - .07	.1 - .2	.19 - .36	.04 - .24	2 - 4	10 - 17
Oct	0.4 - 1.3	.03 - .10	0.1 - 2.2	.05 - .10	.1 - .5	.33 - .54	.06 - .41	1 - 5	12 - 36
Nov	0.9 - 1.4	.07 - .15	1.2 - 2.7	.04 - .13	.2 - .4	.18 - .54	.07 - .33	3 - 5	12 - 40
Dec	0.8 - 1.8	.09 - .26	1.0 - 2.4	.08 - .15	.2 - .3	.19 - .45	<.01 - .34	3 - 4	15 - 25
Jan	0.8 - 1.6	.09 - .22	1.2 - 2.3	.06 - .12	.1 - .3	.21 - .41	.22 - .56	3 - 5	18 - 37
Feb	0.7 - 1.5	.11 - .20	1.2 - 1.8	.07 - .13	.1 - .2	.22 - .34	.25 - .46	3 - 8	18 - 38
Mar	0.7 - 1.5	.05 - .15	0.4 - 1.6	.04 - .12	.2	.24 - .40	.23 - .33	1 - 5	8 - 43
Apr	0.5 - 1.4	.07 - .15	0.4 - 1.7	.05 - .12	.1 - .3	.20 - .42	.06 - .45	2 - 5	12 - 40
May	0.3 - 0.8	.05 - .12	0.3 - 1.1	.05 - .08	.2 - .3	.22 - .43	.08 - .41	1 - 5	12 - 32
Jun	0.3 - 0.9	.03 - .09	0.2 - 0.9	.04 - .09	.2 - .7	.17 - .46	.02 - .53	1 - 4	9 - 33
Jul	0.3 - 1.0	.03 - .07	0.2 - 1.0	.04 - .08	.1 - .4	.19 - .50	.29 - .49	1 - 4	13 - 27
Aug	0.3 - 0.8	.03 - .06	0.1 - 0.7	.03 - .07	.1 - .4	.21 - .39	.29 - .30	1 - 2	16 - 28

REGION: CU, DD, DN
COMMENTS: Leaf: May: N 2.1 - 2.3; P .16 - .19; K .3

SPECIES: *Brachiaria humidicola (*syn *Urochloa h.)*
COMMON NAME: Koronivia grass, humidicola
CULTIVAR: Tully
PLANT PART: Tops

MONTH	NUTRIENT CONCENTRATION RANGE				
	B	**Fe**	**Mn**	**Mo**	**Cl**
Sep					
Oct					
Nov					
Dec					
Jan	5 - 6	83 - 400			
Feb				<.2 - .4	
Mar				.4	
Apr	4 - 6	50 - 209		<.2	
May	4 - 10				
Jun					
Jul					
Aug					

REGION: AR, CU, DD, DN

SPECIES: *Brachiaria mutica (*syn *Urochloa m.)*
COMMON NAME: Para grass
PLANT PART: Tops

MONTH	NUTRIENT CONCENTRATION RANGE								
	N	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.2 - 0.7	.08 - .17	0.3 - 2.5	.08 - .30	.2 - .3	.21 - .37	.03 - .08	2 - 5	18 - 19
Oct	0.2 - 3.4	.08 - .37	0.5 - 3.9	.11 - .23	.2 - .6	.17 - .37	.22 - .27	3 - 9	25 - 40
Nov	0.7 - 3.0	.12 - .29	2.1 - 3.3	.14 - .29	.2 - .5	.20 - .37	.01 - .35	6 - 11	24 - 42
Dec	1.2 - 2.3	.16 - .30	2.6 - 3.4	.12 - .31	.2 - .3	.19 - .32	.06 - .32	5 - 7	18 - 30
Jan	0.7 - 3.1	.10 - .31	1.4 - 3.2	.15 - .33	.2 - .3	.25 - .33	.04 - .43	4 - 9	14 - 33
Feb	0.5 - 2.1	.11 - .25	2.1 - 2.9	.11 - .25	.3 - .4	.21 - .37	.06 - .18	4 - 7	23 - 44
Mar	0.5 - 1.5	.06 - .21	1.0 - 2.3	.11 - .18	.1 - .4	.20 - .36	.04 - .25	4 - 5	16 - 30
Apr	0.4 - 1.3	.05 - .19	0.8 - 1.9	.11 - .21	.2 - .4	.24 - .42	.03 - .26	3 - 5	16 - 41
May	0.4 - 1.6	.05 - .19	0.7 - 2.0	.12 - .20	.2 - .4	.24 - .42	.03 - .23	4 - 6	17 - 34
Jun	0.4 - 1.6	.05 - .18	0.4 - 2.3	.05 - .26	.2 - .5	.18 - .36	.03 - .23	2 - 5	16 - 34
Jul	0.4 - 0.8	.02 - .14	0.8 - 1.6	.11 - .20	.3 - .6	.27 - .31	.03 - .24	3 - 6	14 - 32
Aug	0.4 - 0.9	.02 - .14	0.6 - 1.5	.09 - .20	.2 - .5	.16 - .29	.08 - .31	2 - 3	13 - 31

REGION: AR, DN, FL
COMMENTS: Mo: Mar <.2; Apr .4

SPECIES: *Brachiaria mutica (*syn *Urochloa m.)*
COMMON NAME: Para grass
PLANT PART: Leaf/Regrowth

MONTH	NUTRIENT CONCENTRATION RANGE								
	N	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	1.4 - 2.3	.11 - .24	1.9 - 3.5	.20 - .41	.2 - .3	.26 - .40	.34 - .70	6 - 8	34 - 36
Oct	1.7 - 3.9	.11 - .37	1.8 - 4.1	.14 - .32	.3	.24	.31	9	27
Nov	3.0	.29							
Dec	1.9	.18	1.6	.23					
Jan	1.2	.13	1.5	.07					
Feb	1.4 - 2.5	.19 - .27	2.5 - 2.7	.19 - .21					
Mar	0.8 - 2.2	.07 - .32	1.2 - 2.4	.19					
Apr	1.7 - 1.9	.15 - .23	1.9 - 2.1	.10 - .13					
May	1.5	.10 - .15	1.6 - 1.7	.14					
Jun	1.4 - 2.0	.26	2.4	.40	.5	.29	.33	4	31
Jul	0.5 - 1.2	.06 - .15	1.3 - 1.8	.11 - .14	.7	.34	.03	3	15
Aug	1.0 - 1.7	.10 - .22	1.5 - 3.2	.12 - .35	.3 - .5	.23 - .36	.07 - .28	3 - 8	20 - 31

REGION: AR, DN, FL

SPECIES: *Brachiaria mutica (*syn *Urochloa m.)*
COMMON NAME: Para grass
PLANT PART: Stem

MONTH	NUTRIENT CONCENTRATION RANGE								
	N	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.2	.08	2.0	.09	.1	.11	.15	6	35
Oct	0.2	.08	1.3	.09	.2	.18	.05	6	35
Nov									
Dec									
Jan									
Feb									
Mar									
Apr									
May									
Jun									
Jul									
Aug	0.3	.03	0.6	.05	.2	.19	.07	.1	13

REGION: FL

SPECIES: *Brachiaria* spp *(miliiformis(B.m), piligera(B.pil), pubigera, reptans*, syn *Urochloa* spp*)*
COMMON NAME: Green Summer grass *(B.m)* Hairy Armgrass *(B.pil.)*
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.6 - 0.7	.03 - .05	1.0	.12	.8	.43	.01	4	39
Oct	0.5 - 3.1	.08 - .37	4.9	.35	.5	.71	.06	15	64
Nov	0.5 - 1.4	.03 - .08	0.8						
Dec	1.3 - 1.5	.11 - .13	2.6	.16	.5	.33	.02	6	
Jan	1.7 - 2.3	.07 - .26	3.2 - 3.8	.12 - .18	.4 - .5	.19 - .31	<.01 - .01	6 - 9	10 - 38
Feb	1.1 - 2.3	.06 - .25	1.4 - 2.9	.12 - .17	.2 - .6	.22 - .37	<.01	3 - 7	7 - 30
Mar	0.8 - 2.0	.06 - .24	1.6 - 2.9	.06 - .13	.3 - .7	.12 - .34	<.01 - .01	3 - 6	11 - 36
Apr	1.0 - 1.5	.07 - .24	1.5 - 2.3	.10 - .17	.4 - .6	.23 - .35	.01	3 - 4	23 - 31
May	0.7 - 1.3	.10 - .20	0.8 - 2.8		.7	.32	<.01	3	25
Jun	0.5 - 1.7	.07 - .19	1.5 - 2.2	.13 - .17	.6 - .9	.33	<.01 - .02	3 - 4	10 - 17
Jul	1.0 - 1.5	.06 - .07	2.8	.12	.5		<.01	5	24
Aug	0.8	.05							

REGION: AR, DD, DN

SPECIES: *Brachyachne convergens*
COMMON NAME: Common native couch
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.4 - 0.6	.02 - .05	0.9	.13 - .19	.2 - .4	.16	.01	4	38
Oct	0.4 - 0.8	.02 - .11	0.1	.07	.3	.09	<.01	4	19
Nov	0.3 - 2.9	.01 - .18			.4				
Dec	1.4 - 2.7	.06 - .12	1.3	.16	.5	.21	<.01	4	18
Jan	1.1 - 2.0	.07 - .16	0.9	.16	.7	.19	.02	5	44
Feb	1.0 - 2.1	.04 - .13	1.4 - 1.5	.14 - .18	.3 - .5	.15 - .19	<.01 - .01	4 - 6	27 - 33
Mar	1.1 - 2.1	.08 - .16	1.2 - 1.5	.13 - .16	.4 - .5	.16 - .23	<.01 - .02	4	16 - 27
Apr	0.5 - 2.2	.03 - .18	0.6 - 2.2	.13 - .25	.3 - .5	.15	<.01 - .01	3 - 7	15
May	0.6 - 1.1	.03 - .14	0.8	.12 - .17	.3	.16	.01		18
Jun	0.5 - 0.9	.04 - .09	0.7	.12	.4	.21	<.01	4	15
Jul	0.5 - 0.7	.02 - .09	0.8	.11	.3	.21	.02	3	12
Aug	0.3 - 0.7	.03 - .06							

REGION: CU, DD, DW, KN, VR

SPECIES: *Cenchrus ciliaris*
COMMON NAME: Buffel grass
CULTIVAR: American, Biloela, Gayndah, Molopo, West Australian
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.2 - 1.3	.02 - .09	1.0 - 1.3	.07 - .16	.2 - .5	.15 - .24	<.01-.03	2 - 3	20 - 30
Oct	0.4 - 1.4	.04 - .13	0.7 - 2.1	.09 - .15	.2 - .5	.11 - .18	<.01-.02	2 - 5	13 - 23
Nov	0.6 - 3.3	.05 - .31	1.3 - 4.5	.08 - .31	.1 - .5	.11 - .47	<.01-.01	1 - 9	9 - 37
Dec	0.6 - 2.1	.08 - .29	1.2 - 3.9	.10 - .18	.3 - .4	.12 - .46	<.01-.01	3 - 8	13 - 47
Jan	0.6 - 1.9	.10 - .29	2.5 - 3.7	.12 - .20	.2 - .4	.15 - .38	<.01-.01	4 - 9	14 - 37
Feb	0.5 - 2.1	.08 - .29	1.1 - 3.5	.08 - .19	.2 - .4	.13 - .31	<.01-.03	3 –11	11 - 36
Mar	0.4 - 1.8	.06 - .29	1.1 - 3.5	.08 - .14	.3 - .4	.15 - .18	<.01-.01	3 - 10	19 - 33
Apr	0.4 - 1.6	.04 - .28	1.2 - 3.4	.06 - .16	.3 - .4	.14 - .35	<.01-.02	2 - 8	14 - 45
May	0.3 - 1.6	.04 - .20	1.0 - 2.4	.08 - .14	.2 - .4	.13 - .34	<.01	2 - 5	14 - 39
Jun	0.3 - 1.3	.02 - .10	1.5 - 1.9	.08 - .13	.2 - .6	.19 - .43	.01-.02	3 - 4	22 - 33
Jul	0.3 - 0.7	.06 - .13	1.1 - 1.9	.08 - .12	.2 - .5	.15 - .37	<.01-.01	2 - 3	17 - 25
Aug	0.3 - 0.8	.02 - .12	0.7 - 1.4	.05 - .11	.1 - .6	.06 - .17	<.01-.02	2 - 3	5 - 32

REGION: AR, CU, DD, DN, DW, KN, VR

SPECIES: *Cenchrus ciliaris*
COMMON NAME: Buffel grass
CULTIVAR: American, Biloela, Gayndah, Molopo, West Australian
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE				
MONTH	**B**	**Fe**	**Mn**	**Mo**	**Cl**
Sep					
Oct					
Nov			110 - 190		
Dec					
Jan				.4	
Feb			58 - 91		
Mar				.4	
Apr			83 - 161		
May	6 - 10				
Jun					
Jul					
Aug			90 - 152		

REGION: DD, KN

SPECIES: *Cenchrus ciliaris*
COMMON NAME: Buffel grass
CULTIVAR: American, Biloela, Gayndah, Molopo, West Australian
PLANT PART: Leaf/Regrowth

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.9 - 2.2	.22	1.6	.08	.3	.15	.01	5	10
Oct	1.3 - 2.5								
Nov	1.4 - 3.3	.24 - .33		.31 - .35	.4 - .6				
Dec	1.1 - 1.5								
Jan									
Feb									
Mar									
Apr	1.1 - 2.8	.08 - .23							
May	1.3 - 2.5	.06 - .19	4.0	.13	.5	.16	<.01	4	16
Jun	0.6 - 2.1	.12 - .15							
Jul	0.8 - 1.0								
Aug	0.8								

REGION: AR, DD, DN, KN, VR

SPECIES: *Cenchrus ciliaris*
COMMON NAME: Buffel grass
CULTIVAR: American, Biloela, Gayndah, Molopo, West Australian
PLANT PART: Stem

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.2 - 0.3								
Oct	0.2 - 0.3								
Nov	0.2 - 0.4								
Dec	0.2 - 0.4								
Jan									
Feb									
Mar									
Apr									
May									
Jun	0.2 - 0.3								
Jul	0.2 - 0.3								
Aug	0.2 - 0.3								

REGION: KN

SPECIES: *Cenchrus setiger*
COMMON NAME: Birdwood grass
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.4 - 0.9	.03 - .08		.09	.2				
Oct	0.5 - 0.8	.03 - .08		.09	.2				
Nov	0.7 - 3.4	.03 - .28		.37	.4				
Dec	1.2	.10							
Jan	1.4 - 1.8	.14 - .17							
Feb	1.3 - 1.6	.06 - .13	2.0	.11	.2				
Mar	0.7 - 1.8	.09 - .19							
Apr	0.6 - 2.3	.07 - .20							
May	0.5 - 2.0	.06 - .17		.09	.2				
Jun	0.8 - 1.3	.07 - .13							
Jul	1.1	.05			.3				
Aug	0.5	.06							

REGION: AR, DN, DW, VR
COMMENTS: Leaf: Apr: N 1.7 - 1.9; P .09

SPECIES: *Chloris barbata (*syn *C. inflata)*
COMMON NAME: Purple top chloris
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.7	.30							
Oct									
Nov									
Dec	1.7	.38	1.8	.48	.4	.19	.28		8
Jan	0.9	.20							
Feb	0.7 - 1.3	.17 - .24	1.4	.24	.3	.16	.32	5	56
Mar	2.4 - 2.8	.16 - .17	2.2	.42	.5	.28	.59	10	40
Apr	0.8 - 2.2	.05 - .17	0.9	.06	.2	.09	<.01	3	12
May	0.6	.14 - .30	0.8	.30	.4	.08	1.36	3	24
Jun									
Jul	1.2	.10	1.4	.20	.4	.17	.33	2	32
Aug									

REGION: CU, DN

SPECIES: *Chloris gayana*
COMMON NAME: Rhodes grass
CULTIVAR: Dalgety's, Giant, Katamboora, Top Cut
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep									
Oct	3.3	.30							
Nov	1.0 - 2.6	.25							
Dec	1.0	.14 - .27	1.6 - 1.7	.19 - .27	.4	.13 - .14	.34 - .38	4	15 - 18
Jan	0.8 - 1.0	.22	1.7	.18	.3	.11	.24	4	12
Feb	0.7 - 1.6	.11-.13	1.2 - 1.5	.20		.14		5	25
Mar	0.6 - 1.3	.16	1.4						
Apr	0.5 - 1.2	.10 - .23	1.1 - 1.9	.05 - .20	.4 - .6	.12 - .17	.24 - .31	3	11 - 12
May	0.5 - 0.9	.07-.16	1.3 - 1.4	.17 - .19	.3 - .4	.12 - .13	.16	3	11 - 19
Jun	0.5 - 1.0								
Jul	0.6	.10	0.8						
Aug	0.8 - 0.9	.09	0.9	.09					

REGION: AR, DD, DN, DW, KN, VR

SPECIES: *Chloris gayana*
COMMON NAME: Rhodes grass
CULTIVAR: Dalgety's, Giant, Katamboora, Top Cut
PLANT PART: Tops

MONTH	NUTRIENT CONCENTRATION RANGE				
	B	**Fe**	**Mn**	**Mo**	**Cl**
Sep					
Oct					
Nov					
Dec		121 - 341			
Jan		182			
Feb		506	126		
Mar		75			
Apr	7	117 - 128			
May					
Jun					
Jul					
Aug					

REGION: AR, DD, DN, KN

SPECIES: *Chloris gayana*
COMMON NAME: Rhodes grass
CULTIVAR: Callide
PLANT PART: Leaf

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	1.5 - 2.1	.11 - .13	1.0 - 1.8	.06 - .31					
Oct	1.6 - 3.3	.11 - .30	1.1	.18					
Nov	2.6	.25							
Dec	1.3	.27	1.8	.24					
Jan	0.9	.17	1.6	.12					
Feb	0.8 - 1.4	.11 - .20	1.2 - 1.9	.20					
Mar	0.7 - 1.7	.16 - .20	1.4	.10					
Apr	1.1 - 1.6	.10 - .21	1.1 - 1.7	.05 - .12					
May	0.8 - 1.2	.16 - .17	1.3 - 1.4	.18					
Jun									
Jul	0.6 - 1.0	.10 - .14	0.8 - 1.2	.10					
Aug	0.8 - 1.0	.09 - .14	0.9	.08 - .09					

REGION: AR

SPECIES: *Chrysopogon* spp *(fallax(C.f), latifolius(C.l))*
COMMON NAME: Golden beard grass *(C.f.),* Ribbon grass *(C.l)*
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.2 - 0.5	.02 - .10	0.3	.02 - .09	.2 - .6	.22	<.01	13	19
Oct	0.2 - 2.4	.03 - .18	0.6 - 1.6	.10 - .21	.3 - .4	.13 - .39	<.01 - .10	10 - 14	11 - 37
Nov	0.4 - 1.8	.04 - .18	0.7 - 1.3	.06 - .21	.3 - .4	.15	.02 - .11	15	29
Dec	0.5 - 2.0	.08 - .18	1.0 - 2.1	.09 - .10	.2	.20 - .25	<.01 - .06	3 - 5	22 - 42
Jan	0.6 - 1.4	.05 - .16	0.6 - 1.3	.05 - .11	.1 - .4	.10 - .32	<.01 - .03	3 - 5	19 - 35
Feb	0.5 - 1.7	.05 - .13	0.8 - 1.0	.07 - .17	.2 - .3	.09 - .29	<.01 - .04	7 - 8	23 - 52
Mar	0.4 - 1.6	.04 - .11	0.8 - 1.1	.07 - .08	.2	.09 - .11	.02	4	16 - 31
Apr	0.3 - 1.3	.03 - .12	0.9	.04	.2	.20	.01		
May	0.2 - 1.0	.02 - .09	1.0	.11	.4	.13	.13		40
Jun	0.2 – 1.0	.02 - .06							
Jul	0.2 - 0.9	.01 - .08	0.5	.04	.1 - .4	.16	.03	<1 - 2	6 - 30
Aug	0.3 - 0.7	.03 - .11							

REGION: AR, CU, DN, DW, KN, VR

SPECIES: *Chrysopogon* spp *(fallax(C.f), latifolius(C.l))*
COMMON NAME: Golden beard grass *(C.f.),* Ribbon grass *(C.1)*
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE				
MONTH	**B**	**Fe**	**Mn**	**Mo**	**Cl**
Sep		177	195		
Oct		589 - 680	145 - 166		
Nov		298 - 331	90 - 147		
Dec		747	140		
Jan		379	115		
Feb		395	46		
Mar			54		
Apr		220	105		
May		268	154		
Jun					
Jul		222	214		
Aug					

REGION: AR, KN

SPECIES: *Chrysopogon* spp *(fallax(C.f), latifolius(C.l))*
COMMON NAME: Golden beard grass *(C.f),* Ribbon grass *(C.1)*
PLANT PART: Leaf

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.2 - 1.0	.05 - .10	0.3	.02	.6	.14	<.01	13	19
Oct	0.5 - 1.9	.03 - .16	0.6 - 1.5	.10	.3 - .4	.13 - .14	.02 - .10	14	11 - 36
Nov	0.7 - 1.5	.04 - .14		.06	.3 - .5	.15 - .18	.02 - .11	14 - 15	29 - 36
Dec	0.9 - 2.0	.08 - .19	1.2 - 2.1	.06	.2 - .6	.19 - .24	.02 - .06	5	18
Jan	0.7 - 1.4	.05 - .16	0.9 - 1.0	.04 - .08	.1 - .3	.10	.01 - .03	3 - 5	20 - 35
Feb	0.5 - 1.3	.05 - .10	0.8 - 0.9	.07	.1 - .2	.09 - .14	.02	8 - 14	23 - 32
Mar	0.6 - 1.0	.04 - .09	0.8 - 0.9	.07 - .08	.1 - .2	.09 - .10	.01 - .02	6	31 - 43
Apr	0.5 - 2.2	.03 - .15	0.9 - 1.0	.04 - .08	.1 - .2	.14 - .20	.01	1 - 5	22
May	0.4 - 1.0	.02 - .11	1.0 - 1.2	.07 - .11	.2 - .3	.11 - .13	.01	7	35 - 40
Jun									
Jul	0.4 - 0.9	.04 - .06	0.5 - 0.6	.05	.2	.22	.01	0	19 - 30
Aug	0.3 - 0.7	.06	1.2	.06	.3	.15	.01	3	21

REGION: AR, CU, DN, DD, KN, VR

SPECIES: *Chrysopogon* spp *(fallax(C.f), latifolius(C.l))*
COMMON NAME: Golden beard grass *(C.f.)*, Ribbon grass *(C.1)*
PLANT PART: Leaf

	NUTRIENT CONCENTRATION RANGE				
MONTH	**B**	**Fe**	**Mn**	**Mo**	**Cl**
Sep		177	195		
Oct		589 - 680	145 - 166		
Nov		298 - 835	90 - 147		
Dec		200 - 747	140 - 435		
Jan		119 - 379	115 - 119		
Feb		395 - 711	46 - 118		
Mar		86 - 315	54 - 58		
Apr		159 - 220	105 - 143		
May		268 - 286	63 - 154		
Jun					
Jul		222 - 264	108 - 214		
Aug		230	79		

REGION: AR, KN

SPECIES: *Chrysopogon* spp *(fallax(C.f), latifolius(C.l))*
COMMON NAME: Golden beard grass *(C.f),* Ribbon grass *(C.l)*
PLANT PART: Stem

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep									
Oct									
Nov									
Dec									
Jan									
Feb									
Mar	0.4	.02							
Apr	0.2	.01							
May	0.3	.02							
Jun									
Jul									
Aug									

REGION: KN

SPECIES: *Coelorhachis rottboelloides (*syn *Mnesithea r.)*
COMMON NAME: Northern canegrass
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	1.0	.08							
Oct	1.6	.15							
Nov	0.8	.06							
Dec	0.6	.07							
Jan	0.9 - 1.1	.07							
Feb	0.4 - 1.1	.06							
Mar	0.5 - 1.1	.03 - .06	0.8	.07	.3	.23	.01	4	12
Apr	0.6 - 1.2	.09							
May	0.5 - 0.9	.07							
Jun	0.3	.03	0.2	.05	.2	.22	.02	1	7
Jul	0.8	.07							
Aug	0.2	.02	0.2	.04	.2	.14	.02	1	5

REGION: AR, CU, DD, DN

SPECIES: *Cynodon arcuatus*
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep									
Oct									
Nov	1.8	.12	1.6	.23	.4	.35	.01	6	36
Dec									
Jan	1.3	.24	1.6	.20	.5	.28	.01	3	24
Feb	1.1 - 1.4	.09 - .15	1.0 - 1.4	.10 - .16	.2 - .4	.14 - .18	<.01	2 - 5	6 - 24
Mar	1.1 - 1.9	.15 - .22	1.5 - 2.2	.13 - .19	.3 - .5	.16 - .20	<.01 - .01	4 - 7	8 -21
Apr	1.3 - 2.1	.15 - .17	1.5 - 2.3	.19 - .26	.4	.19 - .28	<.01 - .01	4 - 7	21 - 22
May	0.7	.03	0.7	.10	.2	.37	.01	5	15
Jun									
Jul									
Aug									

REGION: CU, DD, FL
COMMENTS: Mo: Feb .8

SPECIES: *Cynodon dactylon*
COMMON NAME: Green couch
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.2 - 2.0	.05 - .14	1.5 - 2.1	.29 - .49	.4 - .5	.23 - .24	.04	4 - 9	34
Oct	0.9 - 2.0	.15 - .16	1.8 - 2.5	.42	.4	.23	.03	5	
Nov	2.8 - 3.1	.19 - .20	1.9 - 2.3	.28 - .40	.6	.15 - .27	<.01 - .02	8 - 11	37 - 41
Dec	1.4 - 2.9	.17 - .34	1.7 - 3.3	.46 - .63	.4	.18 - .27	.02 - .05	6 - 14	18 - 35
Jan	1.4 - 2.3	.20 - .21	1.7 - 1.9	.51 - .68	.4 - .6	.16 - .27	.01 - .02	6 - 8	18 - 43
Feb	0.6 - 2.5	.07 - .34	1.7 - 1.9	.44 - .63	.4 - .8	.20 - .35	<.01 - .01	7 - 11	21 - 37
Mar	1.8 - 2.9	.13 - .29	1.5 - 1.8	.34 - .53	.3 - .6	.20 - .25	.02 - .11	5 - 10	28 - 36
Apr	0.9 - 2.3	.13 - .24	1.5 - 2.0	.50 - .62	.5 - .7	.17 - .36	<.01 - .02	5 - 7	32 - 40
May	0.7 - 2.1	.10 - .21	1.8 - 1.9	.47 - .55	.5 - .6	.18 - .31	.01 - .02	6 - 8	29 - 31
Jun	0.5 - 2.0	.05 - .17	0.8 - 1.8	.18 - .47	.2 - .6	.12 - .31	.01	1 - 6	12 - 29
Jul	1.1	.07	1.4	.44	.2 - .6	.22 - .33	<.01 - .12	3 - 8	11
Aug	0.9 - 1.8	.07 - .13	1.1 - 1.4	.27 - .30	.4 - .8	.19	.02	2 - 8	19

REGION: AR, CU, DN, FL

SPECIES: *Dactyloctenium* spp *(aegyptium(D.a), radulans(D.r))*
COMMON NAME: Coastal button grass *(D.a)* Button grass *(D.r)*
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	1.3	.05	1.0	.16				5	
Oct									
Nov	3.1	.12	1.8	.31	.7	.69	.39	7	54
Dec									
Jan	0.9	.12	2.2	.26	.5	.29	<.01	4	38
Feb	1.9 - 2.3	.15 - .17	2.1	.25	.4	.33	.21	7	
Mar	1.6 - 2.5	.16 - .35							
Apr	0.8 - 1.5	.09 - .18	1.7 - 2.3	.12 - .23	.4 - 0.7	.31 - .42	<.01 - .17	4 - 5	30 - 43
May	0.8	.05							
Jun									
Jul	1.3	.07	3.7		1.0	.37	<.01	4	8
Aug		.03	2.2	.18	.9		<.01	3	6

REGION: CU, DD, DN, VR

SPECIES: *Dichanthium* spp *(annulatum(D.an.), aristatum(D.ar.), fecundum(D.f), sericeum(D.s))*
COMMON NAME: Sheda grass *(D. an.),* Angleton grass *(D.ar.)*, Curly bluegrass *(D.f)*, Queensland bluegrass *(D.s)*
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.4 - 0.8	.03 - .06							
Oct	0.3 - 0.5	.03 - .06		.08	.3				
Nov	0.3 - 1.6	.03 - .17							
Dec	1.0 - 1.4	.08 - .18							
Jan	0.9 - 1.2	.08 - .12							
Feb	1.3 - 1.8	.14 - .24							
Mar	0.7 - 1.4	.05 - .19							
Apr	0.6 - 1.3	.06 - .13							
May	0.4 - 1.2	.03 - .12			.3 - .4				
Jun	0.3 - 0.9	.03 - .10							
Jul	0.4 - 0.8	.03 - .10	1.0 – 1.3	.10 – 1.3	.4 - .5	.11 - .14	<.01 - .01		46 – 59
Aug	0.4 - 0.9	.03 - .09							

REGION: DN, DW, VR

SPECIES: *Digitaria eriantha (*syn *D. decumbens)*
COMMON NAME: Pangola grass
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.3 - 1.2	.03 - .10	0.2 - 0.6	.06 - .12	.1 - 0.5	.12 - .26	.02 - .25	2 - 9	11 - 39
Oct	0.4 - 3.4	.05 - .30	0.2 - 2.9	.06 - .20	.2 - 0.7	.18 - .27	.02 - .42	2 - 11	19 - 38
Nov	0.7 - 3.1	.07 - .33	0.6 - 1.3	.06 - .11	.3 - 1.0	.07 - .24	.03 - .44	4 - 11	23 - 34
Dec	0.4 - 2.1	.10 - .24	0.8 - 2.3	.08 - .23	.3 - 0.8	.07 - .28	.02 - .49	2 - 10	14 - 32
Jan	0.4 - 1.8	.12 - .26	0.8 – 2.0	.12 - .19	.3 - 0.6	.11 - .28	.16 - .41	3 - 10	14 - 34
Feb	0.5 - 1.8	.08 - .23	0.8 - 1.8	.10 - .18	.2 - 0.5	.05 - .31	.08 - .43	3 - 12	14 - 44
Mar	0.4 - 1.6	.08 - .23	0.7 - 1.6	.07 - .17	.3 - 0.5	.13 - .27	.09 - .38	2 - 8	13 - 33
Apr	0.5 - 1.5	.05 - .22	0.3 - 1.8	.07 - .17	.2 - 0.7	.14 - .29	.06 - .50	3 - 9	13 - 45
May	0.3 - 1.4	.04 - .16	0.3 - 1.5	.07 - .17	.3 – 0.5	.09 - .29	.06 - .28	1 - 7	12 - 42
Jun	0.4 - 1.1	.04 - .16	0.2 - 1.3	.07 - .16	.3 - 0.6	.12 - .40	.06 - .32	1 - 6	12 - 45
Jul	0.4 - 1.1	.04 - .11	0.2 - 1.0	.06 - .15	.3 - 0.6	.13 - .24	.06 - .32	3 - 5	14 - 35
Aug	0.3 - 0.7	.05 - .10	0.2 - 0.7	.05 - .12	.3 - 0.7	.11 - .31	.02 - .24	2 - 4	12 - 28

REGION: AR, CU, DD, DN, KN

SPECIES: *Digitaria eriantha (*syn *D.decumbens)*
COMMON NAME: Pangola grass
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE				
MONTH	**B**	**Fe**	**Mn**	**Mo**	**Cl**
Sep			212		
Oct					.5 - 2.5
Nov					
Dec	6	121 - 130		<0.2	
Jan	6	173 - 381		<0.2	
Feb			238	<0.2 - 1.1	
Mar				0.4	
Apr	7 - 8	66 - 326	335 - 396	0.4	
May				0.2 - 0.9	
Jun					
Jul					
Aug			130 - 320	0.7 - 0.8	.5

REGION: AR, CU, DD, DN,KN

SPECIES: *Digitaria eriantha (*syn *D.decumbens)*
COMMON NAME: Pangola grass
PLANT PART: Leaf/Regrowth

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	1.5 - 1.6	.13 - .14	0.9	.21	.5	.17	.09	9	26
Oct	3.4	.30							
Nov	1.8 - 3.1	.24 - .33	2.2	.14	.5	.23	.53	8	25
Dec	1.1	.12	0.8	.15					
Jan	1.0	.17	1.0	.12					
Feb	1.7	.15	1.2	.15					
Mar	1.3 - 1.5	.12 - .37	1.1 - 2.2	.09 - .14	.5	.21	.34	8	29
Apr	1.1	.08	1.2	.03					
May	1.0 - 1.8	.11 - .18	0.6	.09					
Jun	0.3 - 0.9	.02 - .19	03 - 1.3	.07 - .31	.1	.18	.02	5	
Jul	1.0 - 1.8	.10	1.1	.07					
Aug	0.5 - 1.5	.10 - .13	0.8 - 0.9	.07 - .13	.5	.36	.22	5	42

REGION: AR, CU, DD, DN

SPECIES: *Digitaria milanjiana*
COMMON NAME: Finger grass
CULTIVAR: Jarra, Strickland
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.4 - 1.2	.03 - .04	0.4 - 0.8	.08 - .12	.3 - .4	.83 - 1.06	.03 - .09	2 - 4	26 - 29
Oct	0.5 - 1.4	.02 - .08	0.4 - 0.8	.05 - .11	.2 - .8	.11 - 0.93	.01 - .08	2 - 4	12 - 44
Nov	1.3 - 2.0	.07 - .15	1.2 - 2.9	.05 - .08	.5 - .7	.31 - 0.86	.02 - .10	4 - 7	21 - 42
Dec	0.8 - 2.4	.08 - .23	1.3 - 2.3	.06 - .19	.4 - .6	.17 - 0.78	<.01 - .18	3 - 9	16 - 40
Jan	0.7 - 2.4	.10 - .23	1.1 - 3.2	.08 - .18	.3 - .4	.27 - 0.81	.01 - .05	3 - 9	13 - 37
Feb	0.6 - 1.9	.08 - .17	1.1 - 2.1	.08 - .18	.3 - .4	.29 - 0.61	<.01 - .07	3 - 7	15 - 40
Mar	0.6 - 2.0	.08 - .15	0.8 - 1.7	.10 - .14	.2 - .5	.26 - 0.62	.01 - .05	2 - 5	14 - 24
Apr	0.5 - 2.0	.06 - .19	0.6 - 1.7	.07 - .18	.3 - .8	.34 - 0.67	<.01 - .04	3 - 6	12 - 32
May	0.4 - 2.1	.05 - .18	0.8 - 1.5	.06 - .13	.3 - .8	.15 - 0.65	.01 - .05	3 - 6	16 - 37
Jun	0.5 - 0.7	.04 - .09	0.7 - 1.2	.07 - .12	.4 - .6	.39 - 0.50	.01 - .10	2 - 3	11 - 34
Jul	0.4 - 0.9	.05 - .09	0.5 - 1.2	.06 - .12	.2 - .7	.24 - 0.76	.01 - .13	2 - 5	10 - 40
Aug	0.4 - 0.7	.04 - .06	0.4 - 0.9	.08 - .11	.4 - .8	.27 - 0.95	.02 - .08	2 - 4	15 - 28

REGION: CU, DD, DN, CN
COMMENTS: Regrowth: Oct: N 2.6 - 3.0; P .13 - .14; K 2.5 - 3.1; S .19 - .21; Ca .6 - .8; Mg .48 - 87; Na <.01; Cu 10 - 13; Zn 41 - 48

SPECIES: *Digitaria milanjiana*
COMMON NAME: Finger grass
CULTIVAR: Jarra, Strickland
PLANT PART: Tops

MONTH	NUTRIENT CONCENTRATION RANGE				
	B	**Fe**	**Mn**	**Mo**	**Cl**
Sep					
Oct					
Nov					
Dec	7	113 - 171			
Jan	6	94 - 215		.4	
Feb					
Mar				< .2	
Apr	4 - 11	84 - 332	72		
May					
Jun					
Jul					
Aug					

REGION: CU, DD, DN, KN

SPECIES: *Digitaria pentzii (*syn *D. valida)*
COMMON NAME: Creeping finger grass
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep									
Oct	1.0	.04	0.7	.12	.7	.63	.22	5	27
Nov	1.3 - 2.2	.10 - .15	1.6 - 2.7	.06 - .08				3 - 7	19 - 32
Dec	1.0 - 1.6	.08 - .11	1.5 - 2.4	.08 - .10				4 - 5	16 - 28
Jan									
Feb	0.6 - 1.0	.11 - .15	1.5 - 2.2	.08 - .12				3 - 6	18 - 31
Mar	0.8 - 0.9								
Apr	0.7								
May	0.6 - 1.0	.06 - .07	1.1 - 1.8	.07 - .09				3 - 5	15 - 32
Jun									
Jul									
Aug									

REGION: DN

SPECIES: *Digitaria setivalva*
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep									
Oct									
Nov	1.2 - 1.8	.12 - .17	1.9 - 2.5	.06 - .08				4 - 6	22 - 40
Dec	0.9 - 1.3	.08 - .13	1.2 - 2.2	.07 - .10				4 - 6	19 - 33
Jan									
Feb	0.8 - 1.0	.13 - .19	1.2 - 2.1	.08 - .10				4 - 6	20 - 41
Mar									
Apr									
May	0.6 - 0.9	.05 - .07	0.9 - 1.5	.05 - .06				3 - 4	17 - 32
Jun									
Jul									
Aug									

REGION: DN

SPECIES: *Digitaria smutsii*
COMMON NAME: Digit grass, Tall finger grass
CULTIVAR: Premier
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep									
Oct									
Nov	1.9 - 2.0	.10 - .11	2.9 - 3.5	.07				5 - 7	21 - 27
Dec	1.2 - 1.3	.09 - .10	1.3 - 2.5	.08 - .09				5 - 6	17 - 26
Jan									
Feb	1.0 - 1.2	.10 - .12	1.4 - 2.2	.08 - .09				5 - 6	14 - 31
Mar									
Apr									
May	1.2 - 1.5	.07 - .10	1.8 - 2.1	.06 - .07				5 - 6	18 - 30
Jun									
Jul	0.6	.04	1.2	.08	.3	.41		4	18
Aug									

REGION: DN

SPECIES: *Digitaria* spp *(bicornis(D.bi.), brownii(D.br.), ciliaris(D.c), didactyla(D.d))*
COMMON NAME: Cotton panic grass *(D.br.),* Queensland blue couch *(D.d),* Summer grass *(D.bi., D.c)*
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.4 - 0.6	.03 - .12	2.4 - 2.8	.03 - .05	.2 - .4	.28 - .42	.01	3	23 - 25
Oct	0.5 - 1.0	.08 - .30	1.4 - 2.2	.12	.1 - .4	.25 - .39	<.01 - .01	2 - 6	24 - 37
Nov	0.5 - 2.3	.03 - .18	3.2	.11	.4	.39	.01		24
Dec	1.3 - 1.9	.11 - .32	2.2 - 3.8	.09 - .15	.3 - .4	.24 - .38	.01	4 - 7	7 - 29
Jan	1.4 - 2.0	.08 - .18	2.9 - 3.9	.11 - .20	.3 - .5	.26 - .42	<.01	5 - 11	12 - 26
Feb	0.9 - 1.4	.06 - .27	1.7 - 3.6	.09 - .16	.3 - .4	.21 - .4	<.01 - .01	3 - 6	10 - 26
Mar	0.9 - 2.1	.11 - .29	1.9 - 3.6	.11 - .18	.3 - .6	.32 - .37	<.01 - .01	8 - 11	15 - 38
Apr	0.9 - 1.8	.09 - .27	1.9 - 3.0	.09 - .18	.2 - .5	.28 - .58	<.01 - .01	5 - 8	13 - 18
May	0.7 - 1.5	.06 - .18	1.4 - 2.1	.09 - .12	.2 - .5	.22 - .35	<.01	3 - 5	16 - 32
Jun	0.4 - 1.3	.06 - .13	1.4 - 2.9	.09 - .12	.2 - .4	.23 - .39	<.01	3 - 6	16 - 26
Jul	0.4 - 0.9	.04 - .12	1.2 - 2.1	.08 - .12	.3 - .7	.26 - .36	.01 - .03	2 - 4	14 - 26
Aug	0.4 - 0.7	.03 - .08	2.6 - 2.7	.06 - .13	.4 - .5	.16 - .42	<.01	3 - 7	9 - 13

REGION: CU, DD, DN, VR
COMMENTS: Mo: Feb <.2 - .6; Mar <.2

SPECIES: *Digitaria swynnertonii* (syn *D. milanjiana*)
COMMON NAME: Finger grass
CULTIVAR: Arnhem
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.5 - 0.8	.02 - .03	0.2 - 1.1	.09 - .12	.4 - .5	.30 - .60	.26 - .98	2 - 3	9 - 18
Oct	0.3 - 1.3	.02 - .11	0.1 - 1.5	.07 - .14	.2 - .6	.16 - .37	.14 - .47	3 - 8	12 - 16
Nov	1.7 - 1.9	.08 - .16	0.6 - 2.3	.07 - .18	.5 - .7	.57 - .58	.47 - .73	4 - 8	15 - 33
Dec	0.8 - 1.9	.06 - .18	1.1 - 2.0	.07 - .16	.3	.32 - .35	.37 - .72	3 - 7	15 - 29
Jan	0.6 - 1.4	.08 - .14	1.0 - 1.9	.06 - .14	.2 - .6	.19 - .27	.23 - .52	3 - 4	11 - 23
Feb	0.6 - 2.1	.08 - .21	0.9 - 1.5	.08 - .19	.3 - .4	.16 - .33	.22 - .46	3 - 8	15 - 36
Mar	0.5 - 1.7	.07 - .17	0.6 - 2.1	.08 - .12	.3 - .5	.16 - .35	.17 - .56	2 - 7	9 - 32
Apr	0.6 - 1.5	.05 - .15	0.6 - 1.4	.06 - .12	.3 - .5	.16 - .36	.20 - .56	2 - 6	11 - 24
May	0.5 - 1.1	.04 - .09	0.5 - 1.5	.05 - .11	.5 - .7	.20 - .45	.18 - .56	2 - 6	13 - 32
Jun	0.3 - 0.6	.03 - .06	0.4 - 1.3	.07 - .10	.3 - .7	.20 - .37	.21 - .56	2 - 3	11 - 27
Jul	0.4 - 0.8	.02 - .06	0.2 - 1.4	.07 - .10	.3 - .6	.22 - .57	.18 - .61	3	10 - 36
Aug	0.4 - 0.5	.02 - .04	0.2 - 1.4	.08 - .11	.5 - .7	.23 - .41	.30	2 - 4	12 - 32

REGION: AR, CU, DN
COMMENTS: Leaf: Sep: N 1.5; P .26
Mo: Jan <.2; Mar <.2

SPECIES: *Echinochloa colonum (syn E. colona)*
COMMON NAME: Barnyard grass
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.6	.16	2.2	.39	.3	.57	.02	3	47
Oct	1.9	.17	2.9	.30	.2	.61	.04	7	36
Nov	2.7	.16	2.7	.42	.6	.92	.06	12	64
Dec	2.2	.22							
Jan	1.5 - 4.2	.24 - .28	4.0	.51	.6	.55	.02	16	55
Feb	1.1 - 2.5	.24							
Mar	0.6 - 2.5	.13 - .21	2.7	.27	.4	.34	.02	9	59
Apr	0.4 - 1.9	.26							
May	1.9 - 2.5								
Jun	1.7 - 1.9								
Jul	2.0								
Aug									

REGION: AR, FL

SPECIES: *Echinochloa polystachya (*syn *E. praestans)*
COMMON NAME: Aleman grass
CULTIVAR: Amity
PLANT PART: Tops

MONTH	NUTRIENT CONCENTRATION RANGE								
	N	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	1.4	.16	2.9	.39	.2	.22	.17	6	25
Oct	0.8 - 1.4	.14 - .24	2.7 - 2.8	.19 - .52	.1 - .3	.30 - .31	.47 - .63	6 - 14	23 - 48
Nov	1.7 - 2.1	.17 - .20	2.0 - 2.9	.31 - .65	.1 - .3	.32 - .34	.03	2 - 7	27 - 43
Dec	2.4	.17	3.6	.53	.3	.29	.09	8	20
Jan	2.5 - 2.8	.28 - .48	2.3 - 3.4	.30 - .35	.3 - .4	.31 - .37	.10 - .50	1 - 6	16 - 22
Feb	1.4	.14	2.6	.19	.2	.23	.05	4	18
Mar	2.2	.20	2.4	.19	.3	.21	.05	4	22
Apr	1.4	.15	2.0	.15	.3	.24	.03	3	18
May	1.6	.20	2.2	.19	.4	.35	.07	4	30
Jun	2.7	.19	3.0	.56	.5	.42	.05	10	40
Jul	1.7	.09	2.8	.43	.5	.45	.08	7	33
Aug	1.4	.29	2.5	.30	.6	.38	.24	2	21

REGION: F1
COMMENTS: Regrowth: Oct: N 2.9-3.5; P .28-34; K 2.9-4.6; S .57-.85; Ca .4; Mg .32-37; Na .09; Cu 16; Zn 39-41

SPECIES: *Echinochloa pyramidalis*
COMMON NAME: Antelope grass
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep									
Oct									
Nov									
Dec									
Jan									
Feb	0.8	.11	2.0	.11	.3	.27	.10	5	26
Mar	.4 - 1.2	.06 - .17	0.8 - 1.8	.12 - .20	.4 - .6	.46 - .49	.11	5 - 6	31 - 32
Apr	0.4	.06	0.8	.12	.4	.49	.11	5	32
May									
Jun									
Jul									
Aug									

REGION: AR, DN
COMMENTS: Leaf: Sep: N 2.0; P .39

SPECIES: *Ectrosia leporina*
COMMON NAME: Hare's foot grass
PLANT PART: Leaf

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep									
Oct									
Nov									
Dec									
Jan									
Feb									
Mar									
Apr	1.2	.10							
May	1.2	.06							
Jun									
Jul									
Aug									

REGION: AR

SPECIES: *Eleusine indica*
COMMON NAME: Crowsfoot grass
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.6	.08							
Oct									
Nov	2.3	.34	2.7	.21	.9	.34	.03	9	26
Dec									
Jan	2.8	.23	2.4	.26	.5	.42	.02	8	21
Feb									
Mar	1.9	.18							
Apr	1.3 - 1.6	.35							
May									
Jun									
Jul									
Aug									

REGION: CU

SPECIES: *Enneapogon* spp *(polyphyllus(E.po.), purpurascens)*
COMMON NAME: Leafy Nineawn *(E. po.)*
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.4 - 1.0	.03 - .10		.11 - .14	0.2 - 0.3				
Oct	0.4 - 0.8	.04 - .12		.08	0.3				
Nov	0.4 - 1.9	.03 - .17		.20	0.5				
Dec	0.4 - 1.8	.04 - .16							
Jan	0.8 - 2.0	.06 - .15							
Feb	1.0 - 2.2	.09 - .17			0.4 - 1.1				
Mar	1.1 - 2.4	.06 - .18							
Apr	0.8 - 2.3	.08 - .19			0.2 - 0.3				
May	0.6 - 1.4	.03 - .12		.10	0.4				
Jun	0.5 - 1.3	.03 - .12							
Jul	0.4 - 0.8	.02 - .06							
Aug	0.4 - 0.9	.02 - .09							

REGION: DW, VR

SPECIES: *Eragrostis* spp *(dieslsii(E.d), elongata(E.e), tenellula(E.t))*
COMMON NAME: Love grasses, Mallee lovegrass *(E.d)*, Custered lovegrass *(E.e)*, Delicate lovegrass *(E.t)*
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.2 - 0.9	.02 - .09							
Oct	1.4	.11			.2				
Nov	0.8 - 1.5	.05 - .07	1.1	.11	.1	.12	.10	8	21
Dec	0.7 - 1.7	.07 - .12							
Jan	0.6 - 1.5	.06 - .16	1.3	.15	.2	.24	.11	8	21
Feb	1.1	.07			.3				
Mar	0.6 - 1.3	.07 - .17	0.7 - 1.4	.14	.2	.13	.02 - .09	7	19
Apr	0.5	.04	0.9	.06	.2	.07	.03	2	10
May	0.7	.02							
Jun	0.9 - 1.2	.11 - .12			.3				
Jul	0.2 - 0.8	.01 - .05	1.2	.09	.2	.15	.02	3	35
Aug	0.4 - 0.7	.02 - .13	0.4	.07	.2	.09	.20	3	22

REGION: AR, CU, DD, DN, FL, VR

SPECIES: *Eriachne* spp *(burkittii, obtusa(E.o))*
COMMON NAME: Northern Wanderrie grass *(E.o)*
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.2	.01	0.1	.05				3	17
Oct									
Nov	0.5	.03	0.2	.06	.1	.06	.03	4	17
Dec									
Jan	0.8	.05	0.8	.07	.1	.17	.23	4	11
Feb	0.7	.06			.2				
Mar	0.6	.06	0.7	.06	.1	.08	.01	3	21
Apr	0.5	.06	0.8	.07	.1	.10	.01	3	16
May									
Jun	0.4	.10	0.3	.11				2	22
Jul	0.4 - 0.6	.01 - .05	0.3	.05	.1	.11	.06	3	38
Aug	0.3	.03	0.3	.08	.1	.16	.11	3	

REGION: AR, CU, DN, VR

SPECIES: *Eriachne* spp *(burkittii, ciliata, obtusa(E.o))*
COMMON NAME: Northern Wanderrie grass *(E.o)*
PLANT PART: Leaf/Regrowth

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep									
Oct	1.2 - 1.6	.10 - .20							
Nov	0.7 - 1.2	.05 - .08							
Dec	0.8	.07							
Jan	0.6 - 1.1	.03 - .06							
Feb	0.9	.02							
Mar	0.3 - 0.7	.02 - .04							
Apr	0.2	.04							
May	1.3	.07							
Jun	0.9	.13	1.8	.28	.6	.44	.26	3	30
Jul	0.3 - 0.5	.01							
Aug									

REGION: AR, CU, DN, FL, VR

SPECIES: *Eriochloa procera*
COMMON NAME: Spring grass, Cup grass
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.3 - 0.7	.08 - .11							
Oct	0.6 - 0.7	.05 - .11							
Nov	2.5	.17							
Dec	1.4	.21							
Jan	0.9	.8							
Feb	0.6	.10							
Mar	0.5	.08							
Apr	0.7 - 1.3	.17 - .19							
May	0.7 - 1.0	.09 - .21							
Jun	0.7	.17							
Jul									
Aug	0.4 - 0.8	.08 - .16							

REGION: FL

SPECIES: *Heteropogon contortus*
COMMON NAME: Bunch or Black spear grass
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.2 - 0.5	.02 - .08	0.8	.07	.3	.12	.01	4	6
Oct	0.3 - 0.6	.02 - .06	0.7	.06 - .08	.2 - .3	.11	.01	2	4
Nov	0.6 - 1.7	.02 - .16	1.0 - 1.4	.09 - .21	.3 - .5	.13 - .14	<.01	5 - 6	31
Dec	0.8 - 1.5	.07 - .22	1.1	.09	.2	.15	<.01	4	26
Jan	1.2 - 1.4	.10 - .17	1.5	.08	.3	.14	<.01	4	24
Feb	0.6 - 1.5	.07 - .17	0.9 - 1.1	.05 - .14	.2 - .4	.09 - .16	<.01 - .01	3 - 5	27 - 35
Mar	0.5 - 1.7	.04 - .17	0.6 - 1.5	.05 - .08	.2 - .5	.12 - .17	<.01 - .01	3	16 - 27
Apr	0.5 - 1.0	.04 - .18	1.0	.10	.2	.27	<.01	3	17
May	0.3 - 1.1	.03 - .16	1.2	.08	.3	.15	<.01	5	19
Jun	0.4 - 0.8	.05	0.6	.11	.4	.13	<.01	3	23
Jul	0.2 - 0.8	.02 - .08	0.2 - 0.6	.04 - .10	.2 - .3	.07 - .18	<.01	2	14
Aug	0.2 - 0.4	.03 - .05	0.5	.10	.4		<.01	5	22

REGION: AR, CU, DD, KN, VR
COMMENTS: Leaf: N: Jan 1.1; Jul .2; P: Jan .02
Mo: Mar 2.4

SPECIES: *Heteropogon triticius*
COMMON NAME: Giant spear grass
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.3 - 1.1	.04 - .06							
Oct	1.3 - 1.5	.12 - .15	1.7	.11	.2	.27	<.01	6	13
Nov	0.7 - 2.5	.06 - .23	1.0 - 1.6	.05 - .08	.1 - .2	.13 - .19	<.01	4 - 5	14
Dec	0.7 - 0.8	.07 - .09	1.3	.05	.2	.08	<.01	3	22
Jan	0.8 - 0.9	.06	1.8	.07	.2	.08	<.01	3	18
Feb	0.6 - 0.9	.05 - .07	0.8 - 0.9	.08	.2	.17 - .19	<.01 - .01	2 - 4	17
Mar	0.7 - 1.0	.07 - .11	1.4	.06 - .08	.3	.06 - .07	<.01	3 - 4	16 - 19
Apr	0.4 - 0.7	.03 - .08	0.8	.06	.2	.10	<.01	3	13
May	0.3 - 0.6	.02 - .05	0.8	.04	.2	.06	.01	2	18
Jun	0.5	.03	0.9	.05	.2	.12	<.01	2	12
Jul	0.3 - 0.9	.02 - .06	0.4	.07	.2	.15	<.01	2	20
Aug	0.3	.02	0.4	.09	.2	.17	.03	3	

REGION: AR, DD, DN
COMMENTS: Mo: Mar <.2

SPECIES: *Hymenachne acutigluma*
COMMON NAME: Hymenachne, Native hymenachne
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.5 - 2.4	.04 - .22	2.8 - 3.0	.11 - .35	.1 - .2	.13 - .41	.02 - .17	1 - 8	22 - 34
Oct	1.2 - 2.9	.11 - .38	1.7 - 3.6	.22 - .43	.2 - .4	.12 - .39	<.01 - .23	1 - 16	23 - 45
Nov	1.2 - 3.9	.12 - .37	2.2 – 4.2	.24 - .49	.2 - .3	.15 - .49	<.01 - .19	1 - 11	25 - 31
Dec	1.3 - 3.4	.11 - .39	2.1 - 5.0	.33 - .48	.1 - .3	.14 - .51	.01.-.12	1 - 8	27 - 43
Jan	1.5 - 3.5	.14 - .30	2.3 - 4.5	.34 - .47	.1 - .2	.13 - .46	<.01-.05	6 - 7	29 - 39
Feb	1.1 - 2.4	.09 - .21	1.7 - 2.9	.26 - .43	.1 - .2	.12- .29	.01 - .07	2 - 4	21 - 26
Mar	0.9 - 2.0	.12 - .20	2.0 - 2.7	.25 - .46	.1 - .2	.12 - .35	.01 - 13	2 - 4	21 - 27
Apr	1.2 - 2.5	.09 - .17	1.7 - 2.2	.19 - .51	.1 - .2	.14 - .39	<.01 - .15	2 - 4	18 - 31
May	0.9 - 3.1	.09 - .29	1.5 - 2.7	.16 - .30	.1 - .2	.11 - .36	<.01 - .10	1 - 3	15 - 25
Jun	1.1 - 2.0	.07 - .17	1.8 - 2.5	.19 - .33	.2	.12 - .37	<.01 - .10	1 - 4	18 - 27
Jul	0.8 - 2.0	.07 - .25	1.7 - 3.8	.20 - .24	.1 - .2	.12 - .32	.01 - .12	1	16 - 30
Aug	0.7 - 2.0	.07 - .24	1.3 - 3.0	.16 - .25	.2 - .4	.12 - .30	.01 -. 15	1 - 2	29 - 36

REGION: FL
COMMENTS: Mo; Dec <.2; Mar<.2; Apr <.2

SPECIES: *Hymenachne acuitgluma*
COMMON NAME: Hymenachne, Native hymenachne
PLANT PART: Tops

MONTH	NUTRIENT CONCENTRATION RANGE				
	B	**Fe**	**Mn**	**Mo**	**Cl**
Sep	6 - 9				1.0
Oct					.7 - 1.0
Nov					1.3 - 1.8
Dec				<.2	1.2 - 1.6
Jan					1.2 - 1.7
Feb					.8 - 1.3
Mar				<.2	1.2
Apr				<.2	0.9
May					1.1
Jun					0.9
Jul					0.8
Aug					0.9

REGION: FL

SPECIES: *Hymenachne acutigluma*
COMMON NAME: Hymenachne, Native hymenachne
PLANT PART: Leaf/Regrowth

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	1.8 - 4.3	.13 - .31	2.0 - 3.6	.15 - .69	.2 - .3	.25 - .54	.03 - .20	2 - 12	15 - 39
Oct	1.7 - 3.4	.09 - .30	1.4 - 2.5	.33 - .36	.1 - .3	.25 - .41	.02 - .04	1 - 11	19 - 43
Nov	2.2 - 3.9	.14 - .24	2.0 - 2.7	.36	.2	.21	<.01	9	
Dec									
Jan	2.4 - 3.5	.23 - .26	2.7 - 3.1						
Feb	1.9 - 2.9	.18 - .24	2.3 - 2.9						
Mar	1.9	.19	2.1						
Apr	2.1 - 3.8	.14 - .25							
May	2.2 - 3.6	.13 - .28	1.4 - 1.9						
Jun	1.1 - 1.5	.13 - .19							
Jul	1.3 - 2.9	.17 - .24	2.3 - 3.2						
Aug	0.5 - 1.4	.07 - .16							

REGION: FL
COMMENTS: B: Sep 7.-.15

SPECIES: *Hymenachne acutigluma*
COMMON NAME: Hymenachne, Native hymenachne
PLANT PART: Stem

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep									
Oct	0.6 - 1.2	.05 - .17	0.9 - 2.0		.2 - .3	.18 - .22	.02 - .04	12 - 14	52 - 55
Nov	0.6	.07	0.6						
Dec									
Jan	1.3 - 3.3	.10 - .32	2.7 - 4.9						
Feb	0.8 - 1.5	.14 - .20	1.9 - 3.7						
Mar	0.8	.12	2.6						
Apr	0.4 - 0.8	.06 - .10							
May	0.5 - 0.8	.06 - .11	2.0 - 2.9						
Jun	0.6 - 0.8	.08 - .11							
Jul	0.6 - 1.2	.09 - .13							
Aug									

REGION: FL

SPECIES: *Hymenachne amplexicaulis*
COMMON NAME: Hymenachne
CULTIVAR: Olive
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	1.1 - 2.0	.17 - .32	2.8 - 3.3	.28 - .39	.1 - .2	.26 - .35	.03 - .30	2 - 4	32 - 36
Oct	2.5 - 3.1	.12 - .38	3.3 - 4.5	.45 - .53	.1 - .2	.21	<.01 - .03	3 - 11	32 - 44
Nov	2.6 - 2.9	.20 - .33	3.8 - 4.0	.50 - .53	.1 - .3	.27 - .37	<.01 - .02	4 - 9	30 - 42
Dec	0.9	.13	1.8	.28	.1	.44		3	
Jan	2.2 - 3.4	.23 - .25	3.0 - 3.4	.35 - .36	.1	.16 - .22	<.01 - .02	2 - 6	17 - 26
Feb	2.7	.20	2.6	.25	.1	.15	.02	3	21
Mar	2.0	.18	2.6	.25	.1	.18	.03	2	25
Apr	1.6	.19	2.1	.25	.1	.18	.01	2	26
May	1.9	.16	2.7	.30	.1	.23	.02	2	23
Jun	1.7	.25	2.9	.38	.2	.33	.03	2	29
Jul	1.7	.21	1.7	.25	.1	.35	.02	1	26
Aug	1.6	.20	2.8	.35	.2	.34	.02	4	36

REGION: FL
COMMENTS: Regrowth: Sep: N 4.3; P .24; K 3.5; S .51; Ca .2; Mg .28; Na <.01; Cu 10; Zn 47

SPECIES: *Hyparrhenia rufa*
COMMON NAME: Thatching grass, Thatchgrass
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.2 - 0.4	.02 - .07	0.3 - 1.1	.02 - .04	.2 - .8	.36 - .47	.01 - .03	1 - 3	5 - 23
Oct	0.4 - 0.6	.03 - .04	0.3 - 0.7	.04 - .06	.2 - .7	.26 - .47	<.01 - .01	2	8 - 17
Nov	1.8 - 1.9	.11 - .15	1.6 - 1.7	.06 - .07	.3 - .5	.26 - .47	<.01 - .02	6 - 9	14 - 20
Dec	1.3 - 1.8	.10 - .17	0.4 - 1.6	.06 - .12	.3 - .4	.40 - .45	<.01 - .01	4 - 8	10 - 34
Jan	1.0 - 2.1	.09 - .20	0.8 - 2.3	.07 - .13	.2 - .5	.25 - .58	<.01 - .02	3 - 8	12 - 26
Feb	1.0 - 1.6	.07 - .12	1.0 - 2.2	.06 - .11	.2 - .5	.25 - .42	<.01 - .01	3 - 5	14 - 31
Mar	0.5 - 1.6	.07 - .12	0.5 - 2.1	.07 - .14	.4	.19 - .38	<.01 - .01	2 - 5	13 - 32
Apr	0.5 - 1.3	.06 - .15	0.5 - 2.0	.05 - .13	.2 - .7	.20 - .46	<.01 - .01	2 - 6	13 - 42
May	0.5 - 1.1	.06 - .12	0.5 - 1.2	.05 - .10	.2 - .6	.20 - .42	<.01 - .01	1 - 3	18 - 37
Jun	0.3 - 0.8	.03 - .06	0.4 - 1.0	.03 - .06	.2 - .4	.19 - .32	<.01 - .03	1 - 3	10 - 28
Jul	0.1 - 0.3	.02 - .03	0.3 - 0.8	.03 - .05	.2 - .5	.17 - .35	<.01 - .01	1 - 3	9 - 34
Aug	0.2 - 0.3	.02 - .03	0.3 - 0.7	.03 - .07	.2 - .6	.15 - .38	<.01 - .01	1 - 3	11 - 42

REGION: CU, DD, DN, KN
COMMENTS: Mo: Jan <2; Feb <.2; Mar <.2

SPECIES: *Hyparrhenia rufa*
COMMON NAME: Thatching grass, Thatchgrass
PLANT PART: Leaf/Regrowth

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.7	.04	0.5	.05	.9	.46	.05	2	15
Oct	1.8	.12	1.4	.02	.3	.39	.01	5	8
Nov									
Dec									
Jan									
Feb									
Mar	1.6 - 2.1	.19 - .27	1.6 - 1.9	.12 - .16	.4 - .5	.29 - .40	.01	9 - 11	37 - 38
Apr									
May									
Jun									
Jul	0.6	.05	0.4	.07	.7	.63	.01	4	27
Aug	1.4	.07	0.7	.09	.6	.51		2	14

REGION: CU, DD, DN

SPECIES: *Imperata cylindrica*
COMMON NAME: Blady grass
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep									
Oct									
Nov	0.6	.05	0.8	.06	.2	.12	<.01	3	10
Dec									
Jan	0.6 - 1.1								
Feb	0.6 - 1.1								
Mar	0.7 - 1.2								
Apr	0.7 - 1.3								
May									
Jun									
Jul									
Aug									

REGION: CU

SPECIES: *Ischaemum* spp *(decumbens, rugosum)*
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep									
Oct									
Nov									
Dec									
Jan	0.6 - 1.6								
Feb	0.6 - 1.5								
Mar	0.7 - 1.6	.16							
Apr	0.6 - 1.5	.14							
May	0.4 - 1.1	.10							
Jun	0.5 - 1.0								
Jul									
Aug									

REGION: FL

SPECIES: *Iseilema* spp *(ciliatum, fragile(I.f), macrathermum(I.ma.), membranaceum(I.me.), vaginiflorum(I.v))*
COMMON NAME: Short Flinders grass *(I.f)*, Bull Flinders grass *(I.ma.)*, Small Flinders grass *(I.me.)*, Red Flinders grass *(I.v)*
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.3 - 0.4	.02 - .04			.2				
Oct	0.3 - 1.1	.02 - .10		.06	.4				
Nov	0.3 - 2.0	.02 - .20			.2				
Dec	0.3 - 1.6	.03 - .20	1.8	.17	.5	.24	.01	4	15
Jan	0.5 - 1.1	.07 - .10							
Feb	0.6 - 1.9	.08 - .10			.4				
Mar	0.5 - 1.3	.03 - .12	0.8	.08	.3	.17	<.01		70
Apr	0.6 - 1.3	.07 - .15	1.5	.16	.6	.22	<.01	4	21
May	0.3 - 1.0	.03 - .09							
Jun	0.2 - 0.9	.03 - .11							
Jul	0.3 - 0.8	.02 - .10	0.7	.13 - .15	.2 - .6	.10 - .16	<.01 - .01		47 - 68
Aug	0.3 - 0.6	.03 - .06							

REGION: DW, KN, VR
COMMENTS: Fe: Dec 554

SPECIES: *Leersia hexandra*
COMMON NAME: Swamp ricegrass
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.8	.14	1.2	.12	.4	.22	.09	1	40
Oct	1.4	.13	1.1	.22	.4	.23	.08	2	66
Nov	2.6	.17	2.2	.21	.2	.20	.01	4	46
Dec	2.0	.18	2.0	.19	.1	.15	.01	5	42
Jan									
Feb	1.4	.15	2.9	.48	.4	.21	.24	5	16
Mar	1.3	.11	2.4	.61	.4	.20	.33	6	17
Apr									
May									
Jun									
Jul	0.8	.06	1.0	.10	.2	.16	.02	2	36
Aug	1.1	.07	1.2	.13	.4	.28	.04	3	37

REGION: FL

SPECIES: *Melinis minutiflora*
COMMON NAME: Molasses grass
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep									
Oct									
Nov	1.2 - 1.6								
Dec									
Jan	0.5								
Feb	0.5 - 0.6								
Mar	0.4 - 0.8								
Apr	0.4 - 0.5								
May	0.5 - 0.7								
Jun	0.4 - 0.7								
Jul									
Aug									

REGION: DD, DN

SPECIES: *Oryza* spp *(meridionalis, rufipogon)*
COMMON NAME: Wild rice
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep									
Oct									
Nov	3.3	.08	1.2	.26	.3	.28	.12		
Dec	1.3	.06	1.6	.23	.3	.25	.06		
Jan	0.8 - .3.1	.08 - .17	1.4 - 2.4	.11 - .22	.2 - .3	.14 - .27	.17 - .38	3	19
Feb	1.0 - 4.1	.08	1.5 - 2.8	.17 - .18	.1 - .2	.18 - .19	.20 - .57		
Mar	1.0 - 3.1	.14	0.9 - 2.7	.09 - .12	.1 - .2	.12 - .18	.02 - .30	3	23
Apr	0.7 - 2.1	.01 - .17	1.2 - 1.6	.06 - .10	.2	.17	.13 - .22	1	16
May	0.7 - 1.2	.07 - .08	1.7 - 1.8	.06 - .12	.1 - .3	.16 - .23	.34 - .54	2	42
Jun									
Jul	0.8	.08	1.0	.11	.3	.14	.03	2	20
Aug									

REGION: FL
COMMENTS: Leaf: Feb N 2.0; P .08
Cl: Nov 1.2; Dec .8; Jan 1.1; Feb .6 - 1.4; Mar 1.2; Apr .5: May .9

SPECIES: *Panicum makarikariensis* var *makarkariensis*
COMMON NAME: Makarikari grass
CULTIVAR: Bambatsi, Pollock
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep									
Oct									
Nov									
Dec	0.9 - 1.2	.17 - .28	2.1 – 2.8	.11 - .16	.3 - .4	.18 - .23	.13 - .14	4 - 6	17 - 28
Jan	0.9 - 2.0	.19 - .35	2.4	.11 - .20	.2 - .4	.17 - .33	.07 - .09	5 - 7	18 - 25
Feb									
Mar									
Apr	0.5 - 1.6	.18 - .29	1.4 - 2.4	.11 - .13	.3 - .4	.18 - .34	.03 - .05	3 - 6	11 - 20
May	0.5 - 1.2	.14	2.3	.12	.3	.21	.09	5	14
Jun	1.0								
Jul									
Aug									

REGION: DD, KN

SPECIES: *Panicum makarikariensis* var *makarkariensis*
COMMON NAME: Makarikari grass
CULTIVAR: Bambatsi
PLANT PART: Tops

MONTH	NUTRIENT CONCENTRATION RANGE				
	B	**Fe**	**Mn**	**Mo**	**Cl**
Sep					
Oct					
Nov					
Dec	6	55 - 103			
Jan	8	85 - 149			
Feb					
Mar					
Apr	4 - 8	86 - 109			
May					
Jun					
Jul					
Aug					

REGION: DD, KN

SPECIES: *Panicum maximum (*syn *Urochloa maxima)*
COMMON NAME: Guinea grass
CULTIVAR: Coloniao, Common, Green Panic, Hamil
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.4 - 1.2	.08 - 10	0.3 - 2.2	.09 - .10	.4 - 0.6	.18 - .30	.01 - .04	1 - 2	11 - 25
Oct	0.4 - 3.7	.11 - .31	1.2 - 2.3	.08 - .14	.5 - 0.8	.24 - .63	<.01 - .03	2 - 4	11 - 41
Nov	1.3 - 3.0	.07 - .25	1.6 - 2.8	.07 - .10	.4 - 1.0	.38 - .62	<.01 - .02	4 - 5	20 - 38
Dec	0.6 - 2.2	.07 - .23	1.5 - 2.9	.12 - .24	.6 - 1.0	.26 - .51	.01 - .03	2 - 7	15 - 36
Jan	0.6 - 1.4	.12 - .24	1.7 - 2.8	.11 - .14	.4 - 0.8	.23 - .44	.01 - .02	3 - 5	15 - 21
Feb	0.4 - 2.1	.09 - .22	1.1 - 2.9	.10 - .16	.2 - 0.8	.23 - .43	<.01 - .04	2 - 7	25 - 45
Mar	0.5 - 1.5	.08 - .22	1.2 - 2.4	.08 - .17	.3 - 0.7	.25 - .59	<.01 - .04	4 - 8	17 - 42
Apr	0.4 - 1.6	.12 - .21	1.0 - 2.6	.04 - .14	.3 - 0.7	.22 - .59	<.01 - .02	2 - 6	12 - 38
May	0.3 - 1.5	.05 - .22	0.3 - 2.1	.07 - .15	.5 - 0.9	.20 - .64	.01 - .05	1 - 5	13 - 41
Jun	0.5 - 1.4	.05 - .22	0.3 - 1.9	.08 - .12	.6 - 0.9	.36 - .61	<.01 - .02	1 - 3	22 - 39
Jul	0.5 - 1.0	.05 - .15	0.6 - 1.6	.08 - .12	.6 - 0.8	.30 - .67	.01 - .03	2 - 3	16 - 32
Aug	0.6 - 1.1	.03 - .08	0.6 - 1.3	.07 - .09	.6 - 0.7	.49 - .61		2	14 - 18

REGION: AR, CU, DD, DN, DW, KN

SPECIES: *Panicum maximum (*syn *Urochloa maxima)*
COMMON NAME: Guinea grass
CULTIVAR: Coloniao, Common, Green Panic, Hamil
PLANT PART: Tops

MONTH	NUTRIENT CONCENTRATION RANGE				
	B	**Fe**	**Mn**	**Mo**	**Cl**
Sep					
Oct					
Nov				<.2	
Dec	6 - 7	70 - 248		<.2	
Jan	5	62 - 135		<.2	
Feb		292	190	.5	
Mar				<.2	
Apr	4 - 8	53 - 234			
May					
Jun					
Jul					
Aug					

REGION: AR, CU, DD, DN, KN

SPECIES: *Panicum maximum (*syn *Urochloa maxima)*
COMMON NAME: Guinea grass
CULTIVAR: Common, Hamil
PLANT PART: Leaf/Regrowth

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.8 - 1.4	.04-.20	0.7 - 1.5	.06 - .08	1.3	.79	.01	3	17
Oct	1.0 - 3.7	.05 - .31	1.0 - 3.1	.03 - .21	.5 - 1.0	.36 - .71	<.01 - .04	3 - 10	14 - 29
Nov	2.7 - 3.0	.25							
Dec	1.5	.22	1.6	.10					
Jan	1.2	.03	1.4	.11					
Feb	1.1 - 1.5	.10 - .12	1.5 - 2.1	.10 - .14					
Mar	0.6 - 1.8	.08 - .35	1.2 - 2.5	.11 - .18	.5	.34	.02	5	28
Apr	1.3 - 1.4	.12 - .24	1.5 - 2.3	.04 - .07					
May	0.9 - 1.6	.08 - .15	1.1 - 1.8	.07 - .10					
Jun	1.3 - 1.5								
Jul	0.6 - 1.5	.05 - .15	0.7 - 1.7	.07 - .12	.8 - .9	.50 - .79	<.01 - .01	3 - 7	17 - 32
Aug	0.7 - 0.9	.07 - .12	0.7 - 1.4	.04 - .07					

REGION: AR, DN

SPECIES: *Panicum* spp *(cambogiense, decompositum(P.d), mindanense, trachyrhachis)*
COMMON NAME: Native millet, Australian millet *(P.d)*
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.2	.04 - .10							
Oct	0.3 - 0.6								
Nov	1.0	.14							
Dec	1.8	.23							
Jan	0.5 - 1.6	.10 - .31	1.6	.10	.2	.16	.02	3	15
Feb	0.6 - 1.6	.05							
Mar	0.5 - 1.6	.03							
Apr	0.7 - 1.6	.14 - .15	1.0	.07	.2	.25	.03	4	16
May	0.6 - 1.2	.06 - .12							
Jun	0.2 - 0.7	.03 - .08	0.9	.08	.2	.26	.17	2	20
Jul	0.4 - 0.6	.04 - .05	1.0	.08	.2	.18	.14	4	11
Aug	0.3 - 0.4	.02 - .04	0.5	.08	.2	.11	.10	2	30

REGION: CU, DN, DW, FL, VR

SPECIES: *Paspalum commersonii*
COMMON NAME: Scrobic
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep									
Oct	0.4								
Nov	1.4 - 2.0								
Dec									
Jan	0.6								
Feb	0.5 - 1.1								
Mar	0.4 - 1.0								
Apr	0.5 - 1.0								
May	0.2 - 0.6								
Jun	0.2 - 0.7								
Jul	1.0								
Aug	0.6 - 0.9								

REGION: DN

SPECIES: *Paspalum notatum*
COMMON NAME: Bahia grass
CULTIVAR: Argentine, Pensacola
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.6	.05	1.0	.17	.3	.37	.02	8	
Oct	3.0	.29	2.8	.21	.4	.41	.01	10	48
Nov	1.5 - 3.1	.09 - .24	1.2 - 2.2	.17 - .32	.3 - .4	.43 - .52	<.01 - .01	7 - 14	47
Dec	1.6 - 1.8	.11 - .14	1.5 - 1.9	.22	.3	.34 - .52	<.01 - .01	7 - 9	38 - 56
Jan	1.3 - 1.5	.09 - .15	1.4 - 1.7	.21 - .25	.3 - .4	.34 - .41	<.01 - .01	7 - 8	40
Feb	1.2 - 1.7	.07 - .10	0.9 - 1.0	.25 - .27	.3	.36 - .49	.01 - .02	6 - 8	32 - 60
Mar	1.4 - 1.7	.09 - .17	1.2 - 1.4	.23 - .29	.3	.47 - .49	<.01 - .01	9 - 13	50 - 66
Apr	1.5	.10	0.9	.24	.4	.50	<.01	8	61
May	1.0	.08	1.4	.16	.4	.39	<.01	6	56
Jun	0.3 - 1.0	.03 - .08	0.6 - 1.4	.04 - .13	.3 - .5	.28 - .55	<.01 - .01	1 - 6	10 - 56
Jul	0.7	.05	0.6	.13	.5	.55	.01	5	
Aug	0.6	.06	0.4	.14	.4	.42	.03	5	

REGION: DN

SPECIES: *Paspalum plicatulum*
COMMON NAME: Plicatulum
CULTIVAR: Bryan, Rodd's Bay
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.6	.04 - .09	0.4 - 0.5	.03			.01 - .02	3 - 6	
Oct	0.5 - 3.0	.06 - .25	0.4	.05				4	23 - 25
Nov	0.7 - 1.2	.08 - .17	0.3 - 1.5	.11 - .14				5 - 10	
Dec	1.5 - 1.7	.12 - .13	1.1 - 1.4	.12 - .22			<.01	10 - 12	
Jan	1.4	.10	0.7	.09				8	15 - 16
Feb	1.0 - 1.3	.09 - .16	1.1 - 1.6	.13 - .17			.01	8	
Mar	0.7 - 1.2	.08 - .12	0.8 - 1.1	.06 - .10			.02	3 - 5	15 - 27
Apr	0.8 - 1.1	.08 - .11	1.1 - 1.4	.05 - .10				6	22 - 23
May	0.4 - 0.9	.05 - .12	0.3 - 1.2	.09			.02	4	
Jun	0.3 - 0.6	.05 - .10	0.3 - 1.1	.08			.01 - .02	2 - 5	
Jul	0.3 - 0.7	.03 - .05	0.6 - 0.8	.08				5	16
Aug	0.4	.03	0.7	.06					

REGION: AR, CU, DN, FL

SPECIES: *Paspalum plicatulum*
COMMON NAME: Plicatulum
CULTIVAR: Rodd's Bay
PLANT PART: Leaf

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	1.2 - 1.4	.07 - .10	1.0 - 1.5	.06 - .10					
Oct	1.1 - 3.0	.09 - .25	1.7	.09					
Nov									
Dec	1.3	.13	1.5	.11					
Jan	0.8	.08	0.9	.08					
Feb	1.1 - 1.2	.08 - .09	1.3	.11 - .13					
Mar	0.7 - 1.2	.08 - .12	1.1	.06 - .09					
Apr	1.1 - 1.4	.10 - .13	1.2 - 1.4	.05 - .09					
May	0.7 - 1.6	.06 - .19	1.1 - 1.2	.09 - .10					
Jun	1.2	.11	1.1 - 1.4	.23					
Jul	0.3 - 1.1	.03 - .12	0.8 - 1.1	.08					
Aug	0.4 - 1.3	.03 - .11	0.7	.06					

REGION: AR, CU

SPECIES: *Paspalum* spp *(scrobiculatum)*
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	1.2	.18							
Oct	1.2	.16	1.7	.15	.2	.70	<.01	9	36
Nov	1.1	.08	1.9	.12	.3	.31	.10	8	32
Dec									
Jan	1.0 - 1.7								
Feb	1.0 - 1.3	.07							
Mar	0.7 - 1.3								
Apr	0.7 - 2.0	.18	2.3	.57	.4	.39	.68	5	13
May	1.0 - 2.0								
Jun									
Jul	1.3	.11	2.1	.29	.4	.19	.18	9	30
Aug									

REGION: AR, FL, CU

SPECIES: *Pennisetum glaucum (P. americanum, P, typhoides)*
COMMON NAME: Pearl millet, Bulrush millet
CULTIVAR: Ingrid, Katherine
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.7 - 0.8	.04 - .09	1.4 - 1.8	.10 - .16	.1 - .3	.27 - .40	.03	3 - 6	9 - 19
Oct	0.4 - 0.6	.03	1.1 - 2.0	.14	.2	.46	.02	3	8
Nov									
Dec									
Jan	2.2 - 4.5	.20 - .50	4.1 - 5.0	.21	.4 - .5	.19 - .31	<.01 - .01	9 - 10	13 - 82
Feb	1.0 - 3.9	.10 - .44	2.3 - 4.2	.17 - .26	.3 - .5	.16 - .41	.01 - .02	9 - 10	19 - 69
Mar	0.7 - 3.0	.06 - .32	0.8 - 3.6	.10 - .24	.2 - .3	.22 - .32	<.01 - .02	4 - 11	12 - 54
Apr	0.4 - 1.5	.05 - .31	1.1 - 3.6	.06 - .23	.1 - .3	.22 - .37	.01	4 - 9	23 - 82
May	0.5 - 1.4	.10 - .22	1.6 - 2.4	.08 - .14	.1 - .3	.22 - .45	<.01 - .01	3 - 9	8 - 34
Jun	0.4 - 1.2	.09 - .17	1.3 - 2.0	.09 - .16	.1 - .4	.31 - .34	<.01 - .02	2 - 5	18 - 48
Jul	0.7 - 1.2	.05 - .10	1.5 - 1.8	.09 - .15	.3 - .4	.31 - .40	<.01 - .01	3 - 7	11 - 26
Aug	0.7	.07	1.9 - 2.1	.12 - .15	.3 - .4	.34 - .42	<.01	5 - 6	11

REGION: CU, DD, DN, KN
COMMENTS: Seed Head: Mar: N 2.3; P .43; K 1.5; S .19; Ca .1; Mg .15; Na <.01; Cu 7; Zn 44

SPECIES: *Pennisetum glaucum (*syn *P. americanum, P. typhoides)*
COMMON NAME: Pearl millet, Bulrush millet
CULTIVAR: Ingrid, Katherine
PLANT PART: Leaf/Regrowth

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep									
Oct									
Nov									
Dec									
Jan									
Feb									
Mar	1.3 - 3.3	.21 - .47	1.3 - 3.7	.12 - .24	.3 - .4	.11 - .41	.01	6 - 12	35
Apr	1.3 - 2.5	.21 - .40	2.7 - 3.7	.19 - .21	.3 - .9	.28 - .41	<.01 - .01	7 - 12	35
May	0.4 - 1.3	.21 - .23	2.2 - 2.6	.08 - .12					
Jun									
Jul	1.6	.08	2.2	.12	.4	.37	.01	6	13
Aug									

REGION: CU, DD, DN, KN
COMMENTS: Mar: Fe: 135 - 238; Mn 45 - 57

SPECIES: *Pennisetum glaucum (*syn *P. americanum, P. typhoides)*
COMMON NAME: Pearl millet, Bulrush millet
CULTIVAR: Ingrid, Katherine
PLANT PART: Stem

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep									
Oct									
Nov									
Dec									
Jan									
Feb									
Mar	1.0 - 1.5	.20 - .28	2.8 - 3.4	.10 - .17	.1 - .2	.18 - .20		6 - 9	24 - 30
Apr									
May									
Jun	0.2 - 0.3								
Jul									
Aug									

REGION: DD, KN
COMMENTS: Mar: Fe: 95 - 131; Mn 53 - 56

SPECIES: *Pennisetum pedicellatum*
COMMON NAME: Annual pennisetum
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.1 - 0.8	.02 - .09		.2					
Oct	0.2 - 1.0	.02 - .11							
Nov	2.1	.12							
Dec	1.4 - 2.2	.12							
Jan	0.8 - 1.4	.14							
Feb	0.4 - 1.7	.19 - .22							
Mar	03 - 1.8	.09 - .28	2.1	.10	.7	.18	<.01	7	49
Apr	03 - 1.3	.05 - .19							
May	03 - 1.4	.05 - .15							
Jun	04 - 1.4								
Jul									
Aug	0.4 – 1.2	.05 - .13							

REGION: CU, DD, DN

SPECIES: *Pennisetum purpureum*
COMMON NAME: Elephant grass, Napier grass
CULTIVAR: Capricorn
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep									
Oct	2.3	.19	1.4		.6	.56	.01	7	26
Nov									
Dec									
Jan	0.7 - 1.0								
Feb	0.8 - 1.0								
Mar	0.5 - 0.6								
Apr									
May	0.5 - 1.0	.11	0.8	.07	.2	.35	<.01	3	28
Jun									
Jul									
Aug									

REGION: CU, DN
COMMENTS: Mn: Oct: 34
Leaf: Jun: N 2.0; P .25; S .43

SPECIES: *Plectrachne pungens*
COMMON NAME: Curly spinifex, Soft spinifex
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.8	.04							
Oct	0.8	.04							
Nov									
Dec									
Jan	0.6	.08							
Feb									
Mar	0.6	.09							
Apr									
May									
Jun	0.7 - 0.8	.05 - .07							
Jul	0.3	.03							
Aug									

REGION: VR
COMMENTS: Regrowth: Jun: N 2.0 - 2.1; P .16 - .17

SPECIES: *Pseudopogonatherum contortum*
PLANT PART: Leaf

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep									
Oct									
Nov									
Dec									
Jan	0.8	.07							
Feb									
Mar	0.5	.05							
Apr	0.8	.10							
May									
Jun									
Jul									
Aug									

REGION: AR

SPECIES: *Pseudoraphis spinescens*
COMMON NAME: Spiny mud grass
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	1.3	.09	0.4	.33	.1	.17	.18		
Oct	1.3 - 1.5	.06 - .08	0.5	.26 - .40	.1 - .2	.10 - .26	.14 - .21		
Nov	1.4 - 1.5	.04 - .04	0.3 - 0.4	.28 - .36	.1 - .2	.16 - .22	.13 - .15		
Dec	1.3 - 1.4	.07	0.3 - 0.7	.25 - .27	.1 - .2	.10 - .17	.05 - .11		
Jan	0.9 - 1.1	.06 - .07	0.4 - 1.0	.18 - .23	.1 - .2	.07 - .13	.04 - .09		
Feb	0.9 - 1.2	.07 - .09	0.7 - 0.8	.23 - .30	.1	.09 - .16	.06 - .16		
Mar	1.1 - 1.3	.12	1.6	.25	.3	.17	.25		
Apr	1.0 - 1.1	.08 - .10	0.6 - .0.8	.12 - .25	.1 - .2	.16 - .19	.09 - .18	4	14
May	1.3	.08	0.6	.23	.1	.18	.08		
Jun	1.2	.09	0.6	.27	.1	.17	.07		
Jul	1.3	.10	0.5	.27	.1	.15	.07		
Aug	1.2	.12	0.5	.29	.1	.17	.09		

REGION: FL
COMMENTS: CL: Sep .18; Oct .18 - .25; Nov .17 - .18; Dec .20 - .32; Jan .09 - .38; Feb .25 - .27; Mar .55; Apr .20 May .18; Jun .13; Jul .13; Aug .12

SPECIES: *Schizachyrium* spp *(fragile)*
COMMON NAME: Firegrass
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.3 - 0.5	.01 - .03							
Oct	0.3 - 0.4	.02 - .03							
Nov									
Dec									
Jan									
Feb									
Mar	0.5 - 1.3	04 - .11							
Apr	0.4 - 0.8	.02 - .07	0.6 - 0.8	.06 - .08	.1 - .2	.09 - .17	<.01 - .02	2 - 3	20 - 27
May	0.3 - 0.5	.02 - .06							
Jun									
Jul	0.2	.02							
Aug	0.4	.02	0.3	.08	.2	.18	.02	2	

REGION: AR, CU, DD, VR

SPECIES: *Sehima nervosum*
COMMON NAME: Rat's tail grass
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.8								
Oct	0.2 - 1.1	.01			.4				
Nov	0.7								
Dec	1.8	.26							
Jan	1.3	.12							
Feb	0.6 - 1.0	.06 - .10							
Mar	0.8 - 1.3	.06 - .09							
Apr	0.7 - 0.8	.04 - .15	0.9 - .12	.08	.2	.06	<.01	7	15
May	0.2 - 0.7	.02 - .05	0.5	.04 - .06	.3 - .4	.11 - .17	<.01	2 - 3	19 - 21
Jun	0.2								
Jul	0.2	.02	0.7	.03	.2	.08	.01	1	18
Aug	0.2 - 0.5	.03 - .08			.2 - .3				

REGION: AR, DD, KN, VR
COMMENTS: Leaf: N: Jun .7; Jul .6 - 1.4; Aug 1.0

SPECIES: *Setaria spacelata*
COMMON NAME: Setaria
CULTIVAR: Kazungula
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.8 - 1.4	.02 - .09	1.0 - 1.8	.03 - .06	.1 - .2	.27 - .30	.25 - 0.30	2 - 4	5 - 10
Oct	1.0 - 4.3	.04 - .33	1.1 - 1.9	.04 - .07	.1	.23 - .28	.28 - 0 .47	2 - 3	12 - 15
Nov	1.9 - 4.5	.08 - .29	0.7 - 3.9	.07 - .20	.2 - .3	.16 - .36	.17 - 1.35	6 - 12	19 - 34
Dec	0.9 - 2.4	.05 - .30	0.9 – 3.8	.07 - .17	.2 - .5	.18 - .44	.07 - 1.04	4 - 9	18 - 47
Jan	0.8 - 2.5	.12 - .27	0.9 - 3.9	.07 - .21	.1 - .3	.16 - .41	.13 - 1.30	5 - 11	15 - 47
Feb	0.7 - 1.7	.07 - .19	0.9 – 2.8	.07 - .14	.1 - .4	.13 - .42	.11 - 0.93	3 - 8	10 - 50
Mar	0.5 - 1.8	.11 - .18	0.8 - 3.0	.07 - .12	.2 - .3	.15 - .31	.22 - 0.56	3 - 8	19 - 45
Apr	0.4 - 1.4	.08 - .18	0.8 - 2.9	.05 - .12	.1 - .4	.14 - .31	.04 - 0.75	2 - 6	12 - 45
May	0.4 - 1.5	.04 - .17	0.5 - 2.5	.05 - .13	.1 - .4	.15 - .41	.05 - 0.65	2 - 6	10 - 48
Jun	0.6 - 1.4	.03 - .12	0.5 - 1.7	.06 - .14	.2 - .3	.20 - .44	.16 - 0.55	3 - 4	10 - 46
Jul	0.4 - 1.5	.03 - .10	0.4 - 1.7	.05 - .14	.1 - .3	.16 - .49	.18 - 0.66	3 - 6	7 - 46
Aug	0.7 - 1.3	.03 - .11	1.1 - 1.9	.06 - .08	.1 - .2	.19 - .36	.47 - 0.52	2 - 4	8

REGION: AR, CU, DD, DN, KN

SPECIES: *Setaria spacelata*
COMMON NAME: Setaria
CULTIVAR: Kazungula
PLANT PART: Tops

MONTH	NUTRIENT CONCENTRATION RANGE				
	B	**Fe**	**Mn**	**Mo**	**Cl**
Sep					
Oct					
Nov			300		
Dec	6	92 - 387		.4	
Jan	6	120 - 450		.4	
Feb					
Mar				<.2 - .8	
Apr	4 - 8	49 - 526			
May					
Jun					
Jul					
Aug					

REGION: CU, DD, KN

SPECIES: *Setaria sphacelata*
COMMON NAME: Setaria
CULTIVAR: Kazungula
PLANT PART: Leaf/Regrowth

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	1.0 - 2.5	.04 - .16	1.3 - 2.4	.06 - .14	.2	.35	.65	3	9
Oct	1.8 - 4.3	.06 - .33	1.6 - 1.7	.07 - .14	.1	.24	1.04	5	25
Nov	2.7 - 4.5	.27 - .29	3.7	.26	.3	.33	1.35	9	19
Dec	2.0 - 2.3	.22	2.9	.11 - .13					
Jan	1.2	.04	3.8	.13					
Feb	1.2 - 2.5	.14 - .18	2.2 - 2.5	.08 - .19					
Mar	2.3	.18 - .30	3.0 - 3.6	.13					
Apr	1.4 - 2.4	.12 - .19	2.6	.08					
May	1.5 - 2.7	.12 - .17	1.2 - 3.9	.06 - .15	.1 - .2	.24 - .45		6 - 8	26 - 51
Jun	0.9 - 2.0	.08 - .17	1.7 - 3.4	.07 - .14	.2	.24	1.90	8	51
Jul	0.8 - 1.4	.07 - .12	1.1 - 2.7	.07 - .14	.1	.27	.36	4	8
Aug	0.8 - 2.2	.06 - .11	1.1 - 2.0	.06 - .10	.2	.39	.43	4	12

REGION: AR, CU, DN

SPECIES: *Sorghum australiense*
COMMON NAME: Native sorghum
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep									
Oct	0.6	.04			.4				
Nov									
Dec									
Jan									
Feb	0.8	.07			.4				
Mar									
Apr									
May									
Jun									
Jul	0.3	.02			.3				
Aug									

REGION: VR

SPECIES: *Sorghum intrans*
ON NAME: Spear grass
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.1 - 0.2	.02 - .06	0.6	.02	.2	.10	<.01	1	5
Oct	0.1 - 0.4	.03	0.1						
Nov	0.9 - 2.1	.05 - .13	1.0 - 1.8	.03 - .10	.4	.09 - .13	<.01 - .04	6 - 10	44 - 63
Dec	0.9 - 2.4	.06 - .15	1.1 - 2.5	.09 - .19	.1 - .5	.19 - .24	<.01 - .12	6 - 10	13 - 38
Jan	0.5 - 1.5	.06 - .08	0.5 - 1.7	.10 - .11	.3 - .4	.14 - .21	<.01	6 - 8	14 - 18
Feb	0.4 - 1.1	.05 - .09	1.3 - 2.0	.07 - .10	.2 - .3	.16 - .20	<.01 - .04	3	35
Mar	0.2 - 0.8	.02 - .08	0.4 - 1.5	.04 - .07	.2 - .3	.08 - .11	<.01 - .04	1 - 3	8 - 13
Apr	0.1 - 0.7	.03 - .06	1.1						
May	0.1 - 0.4	.01	0.8	.11	.3	.24	.01	2	30
Jun	0.2 - 0.3	.01 - .06	0.3	.05	.6	.10		2	
Jul	0.2	.01	0.4	.04	.3	.04		2	
Aug	0.2 - 0.3	.01	0.2	.07	.2	.16		2	31

REGION: AR, CU, DD, DN, VR

SPECIES: *Sorghum intrans*
ON NAME: Spear grass
PLANT PART: Tops

MONTH	NUTRIENT CONCENTRATION RANGE				
	B	**Fe**	**Mn**	**Mo**	**Cl**
Sep					
Oct					
Nov					
Dec			89		
Jan					
Feb				.4	
Mar	19		39	<.2 - .5	
Apr					
May					
Jun					
Jul					
Aug					

REGION: CU, DD, DN
COMMENTS: Se: Dec 10

SPECIES: *Sorghum plumosum*
COMMON NAME: Plume sorghum
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.1 - 0.7	.03 - .09	08 - 1.2	.07 - .09	.2	.18 - .23	<.01	4	20
Oct	0.2 - 1.7	.09 - .15							
Nov	0.8 - 1.5	.08 - .13	0.8 - 1.8	.06 - .14	.2 - .5	.14 - .19	<.01 - .07	5 - 14	22 - 42
Dec	0.4 - 2.4	.03 - .15	1.0	.07	.2	.15	<.01	7	20
Jan	0.6 - 1.1	.09 - .11	1.1 - 1.9	.05 - .11	.1 - .3	.11 - .15	<.01 - .03	3 - 11	15 - 44
Feb	0.6 - 1.3	.05 - .09	0.9 - 1.3	.07 - .09	.2 - .3	.05 - .15	<.01 - .01	3 - 12	30 - 54
Mar	0.2 - 0.8	.05 - .11	0.7 - 1.2	.04 - .08	.3 - .4	.11 - .17	<.01 - .01	4	20 - 21
Apr	0.4 - 0.9	.03 - .11	0.7 - 0.9	.03 - .05	.1 - .4	.11 - .12	<.01 - .01	1 - 2	10
May	0.4 - 0.7	.03 - .11	1.1		.5	.17			36
Jun	0.2 - 0.6	.08							
Jul	0.5	.04	0.6						16
Aug	0.2 - 0.6	.05 - .07		.06	.2	.12		4	

REGION: AR, CU, KN

SPECIES: *Sorghum plumosum*
COMMON NAME: Plume sorghum
PLANT PART: Tops

MONTH	NUTRIENT CONCENTRATION RANGE				
	B	**Fe**	**Mn**	**Mo**	**Cl**
Sep		227	193		
Oct					
Nov		249	60		
Dec					
Jan		313	38		
Feb		217	83		
Mar		219	70	.8	
Apr		312	115		
May		212	144		
Jun					
Jul		140	172		
Aug					

REGION: AR, CU, DD, KN

SPECIES: *Sorghum plumosum*
COMMON NAME: Plume sorghum
PLANT PART: Leaf

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.4 - 1.0	.03 - .07	1.0 - 1.2	.05 - .07	.2 - .7	.22 - .26	<.01 - .02	4 - 6	25
Oct	0.8 - 1.7	.13 - .16							
Nov	1.1 - 1.6	.08 - .12	0.8 - 1.8	.14	.2 - .6	.14 - .23	.02 - .06	14	22 - 29
Dec	0.9 - 1.1	.08 - .09	1.2	.09	.4	.18	.02	6	
Jan	0.9 - 1.5	.07 - .10	1.2 - 1.9	.06 - .11	.1 - .3	.15 - .18	<.01 - .03	6 - 11	21 - 44
Feb	0.7 - 1.2	.04 - .09	0.7 - 0.9	.05 - .09	.2 - .3	.09 - .12	.01 - .02	7 - 12	30 - 38
Mar	0.7 - 1.2	.05 - .12	0.7 - 1.0	.08	.2 - .3	.11	.01	9 - 15	21 - 47
Apr	0.4 - 1.3	.03 - .13	0.7 - 1.2	.03 - .07	.1 - .4	.11 - .16	.01	1 - 4	29
May	0.3 - 1.4	.03 - .11	1.1 - 1.3	.05 - .15	.3 - .5	.12 - .17	.02	8	28 - 36
Jun									
Jul	0.5 - 1.2	.04 - .10	0.6 - 1.4	.07	.2	.19	.02	0 - 8	16 - 36
Aug	0.5 - 1.1	.04 - .10	0.9	.03	.2	.19	.01	7	17

REGION: AR, CU, KN
COMMENTS: Seed: Mar N 0.7; P 0.10

SPECIES: *Sorghum plumosum*
COMMON NAME: Plume sorghum
PLANT PART: Leaf

MONTH	NUTRIENT CONCENTRATION RANGE				
	B	**Fe**	**Mn**	**Mo**	**Cl**
Sep		296	156		
Oct					
Nov		249 - 610	60 - 210		
Dec					
Jan		105 - 363	38 - 88		
Feb		217 - 233	83 - 98		
Mar		113 - 190	70 - 113		
Apr		312 - 505	115 - 171		
May		212 - 399	105 - 144		
Jun					
Jul		136 - 140	172 - 186		
Aug		250	112		

REGION: AR, CU, KN

SPECIES: *Sorghum plumosum*
COMMON NAME: Plume sorghum
PLANT PART: Stem

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep									
Oct									
Nov									
Dec									
Jan									
Feb									
Mar	0.2	.02							
Apr	0.1 - 0.2	.01							
May	0.1	.01							
Jun									
Jul									
Aug									

REGION: KN

SPECIES: *Sorghum* spp
COMMON NAME: Forage sorghum
CULTIVAR: Cowchow, Cowpow, Cush, Jumbo, Magic, Silk, Sudax, Sugardrip, Sugargraze, Superdan, Superchow, Zulu
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.5	.04	0.6	.09				4	
Oct									
Nov	1.2 – 3.5	.17 - .44	2.0 – 4.1	.08 - .21	.3 - .5	.21	<.01	8	29
Dec	1.2 - 20	.15 - .43	1.7 – 4.0	.12 - .19	.3 - .5	.30 - .33	<.01	7 - 9	19 - 32
Jan	1.1 - 3.2	.12 - .40	1.0 - 3.7	.11 - .23	.2 - .5	.14 - .39	<.01 - .03	5 - 11	15 - 50
Feb	1.2 - 4.0	.14 - .33	1.4 - 3.4	.11 - .23	.1 - .4	.20 - .45	<.01 - .01	5 - 9	15 - 38
Mar	0.5 - 2.0	.09 - .27	0.6 - 3.3	.04 - .14	.1 - .5	.16 - .53	<.01 - .03	4 - 12	10 - 46
Apr	0.5 - 1.4	.05 - .25	0.5 - 2.8	.05 - .12	.2 - .4	.17 - .45	<.01 - .01	3 - 9	14 - 45
May	0.7 - 1.3	.08 - .16	0.6 - 2.2	.04 - .12	.3 - .5	.17 - .46	.01	3 - 6	5 - 41
Jun	0.5 - 1.2	.04 - .05	0.5 - 1.0	.08 - .09	.3	.45 - .50	<.01 - .01	3 - 4	18 - 46
Jul	0.9	.11	0.4	.11	.5	.54	.02	5	51
Aug	0.8	.06	0.8	.08	.1	.27	.01	3	13

REGION: AR, CU, DD, DN, DW, KN

SPECIES: *Sorghum* spp
COMMON NAME: Forage sorghum
CULTIVAR: Cowchow, Cowpow, Cush, Jumbo, Magic, Silk, Sudax, Sugardrip, Sugargraze, Superchow, Superdan, Zulu
PLANT PART: Tops

MONTH	NUTRIENT CONCENTRATION RANGE				
	B	**Fe**	**Mn**	**Mo**	**Cl**
Sep					
Oct					
Nov					
Dec	6	75 - 324			
Jan	6	83 - 101	50		
Feb	16	83 - 148	92	.5	0.55
Mar		99 - 334	42 - 49		
Apr	4 - 8	50 - 213			
May					
Jun					
Jul					
Aug					

REGION: AR, DD, KN

SPECIES: *Sorghum* spp
COMMON NAME: Forage sorghum
CULTIVAR: Cow chow, Cush, Jumbo, Magic, Silk, Sudax, Surgadrip, Zulu
PLANT PART: Leaf/Regrowth

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.7 - 1.3	.05 - .08	1.2	.04 - .14	.4	.17	<.01	2 - 6	7 - 21
Oct	0.7 - 1.9	.10 - .31	3.0	.13	.6	.27	<.01	7	16
Nov									
Dec									
Jan									
Feb									
Mar	1.5 - 2.2	.17 - .34	1.1 - 2.8	.08 - .30				6 - 13	21 - 39
Apr	2.2	.32	2.1	.14	.3	.34	<.01	5	16
May	0.8 - 1.8	.10 - .22	1.6 - 2.5	.04 - .10				3 - 8	8 - 14
Jun	1.5 - 1.7	.12 - .13	0.9 - 1.0	.11 - .13	.2 - .4	.28 - .43	<.01	3 - 6	14 - 19
Jul									
Aug									

REGION: CU, DD, DN

SPECIES: *Sorghum stipoideum*
COMMON NAME: Giant spear grass
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep									
Oct	0.6	.01			.2				
Nov									
Dec	0.9	.13	1.5	.20	.6	.64		8	51
Jan									
Feb	1.0	.08			.3				
Mar									
Apr								1	12
May									
Jun									
Jul	0.4				.3				
Aug									

REGION: DN, VR

SPECIES: *Sorghum stipoideum*
COMMON NAME: Giant spear grass
PLANT PART: Tops

MONTH	NUTRIENT CONCENTRATION RANGE				
	B	**Fe**	**Mn**	**Mo**	**Cl**
Sep					
Oct					
Nov					
Dec			153		
Jan					
Feb					
Mar	10		60		
Apr					
May					
Jun					
Jul					
Aug					

REGION: DN
COMMENTS: Se: Dec: 1.0; Mar 2

SPECIES: *Sporobolus australasicus*
COMMON NAME: Australian dropseed
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.6	.05							
Oct									
Nov									
Dec									
Jan	2.8	.20							
Feb	2.2	.13							
Mar	1.1 - 2.7	.10 - .19			.2				
Apr	1.8 - 2.5	.14 - .20			.2 - .3				
May	0.9	.13							
Jun	0.6 - 1.1	.04 - .09							
Jul									
Aug	0.6	.08							

REGION: DW, VR

SPECIES: *Themeda arguens*
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.2 - 0.3	.02							
Oct	0.6	.04							
Nov									
Dec									
Jan									
Feb									
Mar	0.6 - 0.8	.05 - .19	0.8	.06	.2	.20	.02	3	17
Apr	0.8 - 1.3	.13 - .21	0.4	.12	.5	.43	<.01	5	24
May	0.3 - 0.4	.02 - .20	0.2	.04	.3	.22	.02	2	1
Jun	0.4	.04							
Jul	0.4	.03	0.5	.06	.3	.29	.01	3	35
Aug	0.3	.08							

REGION: CU

SPECIES: *Themeda triandra*
COMMON NAME: Kangaroo grass
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.2 - 1.0	.01 - .06	0.2 - 0.8	.06 - .08	.4	.14	<.01 - .01	3 - 8	
Oct	0.2 - 2.4	.01 - .20	0.1 - 2.0	.07 - .17	.3	.10 - .18	<.01 - .05	3 - 11	12 - 33
Nov	0.4 - 1.2	.02 - .11	0.8 - 1.7	.04 - .09	.1 - .3	.13 - .20	<.01 - .02	2 - 4	16 - 34
Dec	0.8 - 1.5	.07 - .15	1.0 - 1.6	.07	.1 - .3	.13 - .18	<.01 - .01	3 - 7	17 - 30
Jan	0.5 - 0.9	.04 - .10	0.7 - 1.1	.07 - .09	.1 - .2	.13 - .17	<.01 - .04	3 - 8	20 - 35
Feb	0.4 - 0.9	.03 - .09	0.5 - 1.2	.07 - .09	.1 - .3	.13 - .17	<.01 - .02	4 - 6	24 - 36
Mar	0.4 - 0.9	.03 - .07	0.8 - 1.0	.04 - .11	.2 - .3	.11 - .21	<.01 - .01	3 - 4	13 - 35
Apr	0.3 - 1.0	.02 - .07	0.3 - 1.0	.04 - .08	.2	.12 - .23	<.01 - .01	1 - 6	12 - 54
May	0.2 - 0.8	.02 - .05	0.5 - 0.7	.08	.2 - .4	.11 - .20	<.01 - .02	3 - 4	20 - 35
Jun	0.3 - 0.6	.03	0.5 - 0.6	.05 - .08	.2	.11 - .14	<.01	4	24
Jul	0.2 - 0.6	.01 - .03	0.2 - 0.5	.05 - .09	.1 - .3	.15 - .18	<.01 - .03	1 - 4	13 - 36
Aug	0.2 - 0.6	.02 - .03	0.4	.05	.2	.10 - .18	<.01	3	31 - 36

REGION: AR, CU, DD, DN, KN, VR
COMMENTS: Seed: Mar .7; Apr .5 - .6; May .5; P: .08; Apr .05 - .06; May .05

SPECIES: *Themeda triandra*
COMMON NAME: Kangaroo grass
PLANT PART: Tops

MONTH	NUTRIENT CONCENTRATION RANGE				
	B	**Fe**	**Mn**	**Mo**	**Cl**
Sep		190	310		
Oct		221 - 400	125 - 174		
Nov		313 - 403	50 - 250		
Dec		318	49		
Jan		687	84		
Feb		220	83		
Mar		220	180	.4	
Apr		180	170		
May		93	204		
Jun					
Jul		224	372		
Aug					

REGION: AR, CU, KN

SPECIES: *Themeda triandra*
COMMON NAME: Kangaroo grass
PLANT PART: Leaf

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.2 - 1.1	.01 - .11	0.1 - 0.9	.06	.1 - .3	.16 - .18	.01 - .05	5 - 8	18 - 41
Oct	0.4 - 1.4	.01 - .13	0.1 - 1.1	.09	.3	.10 - .16	.03 - .05	6 - 11	12 - 33
Nov	0.4 - 1.6	.02 - .19	0.9 - 1.7	.09 - .12	.2 - .4	.13 - .19	.02 - .10	14 - 16	19 - 35
Dec	0.7 - 1.2	.07 - .09	0.8 - 1.0	.07	.1 - .4	.13 - .15	.01 - .02	5	23 - 24
Jan	0.7 - 0.8	.05 - .06	0.8 - 0.9	.04 - .09	.1 - .3	.10 - .21	<.01 - .04	2 - 8	25
Feb	0.6 - 0.9	.04 - .06	0.9 - 1.0	.05 - .08	.1	.15	.02 - .04	13	29
Mar	0.6 - 0.9	.04 - .09	0.9 - 1.2	.08 - .09	.1 - .2	.11 - .17	<.01 - .01	2 - 19	26 - 47
Apr	0.3 - 1.6	.03 - .09	0.3 - 0.7	.04	.1 - .2	.13 - .22	.01	1	43
May	0.4 - 0.7	.02 - .07	0.6 - 0.8	.05 - .09	.2 - .4	.15 - .23	.01	3 - 12	26 - 38
Jun	0.8 - 1.0								
Jul	0.2 - 1.1	.01 - .07	0.2 - 0.5	.04 - .06	.2	.15 - .24	<.01 - .02	1 - 6	24 - 40
Aug	0.4 - 0.6	.03 - .05	0.4	.02	.2	.22	.01	3	32

REGION: AR, DD, DN, KN

SPECIES: *Themeda triandra*
COMMON NAME: Kangaroo grass
PLANT PART: Leaf

MONTH	NUTRIENT CONCENTRATION RANGE				
	B	**Fe**	**Mn**	**Mo**	**Cl**
Sep		190 - 311	53 - 350		
Oct		221 - 400	125 - 174		
Nov		213 - 796	50 - 250		
Dec		195 - 318	49 - 365		
Jan		95 - 687	84 - 157		
Feb		220 - 278	83 - 131		
Mar		154 - 220	109 - 180	.4	
Apr		114 - 180	130 - 270		
May		93 - 287	200 - 271		
Jun					
Jul		112 - 224	179 - 372		
Aug		198	222		

REGION: AR, KN

SPECIES: *Themeda triandra*
COMMON NAME: Kangaroo grass
PLANT PART: Stem

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep									
Oct									
Nov									
Dec									
Jan									
Feb									
Mar	0.2	.02							
Apr	0.5 - 0.6	.01 - .02							
May	0.2	.01							
Jun									
Jul									
Aug									

REGION: KN

SPECIES: *Urochloa mosambicensis*
COMMON NAME: Sabi grass
CULTIVAR: Nixon
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.2 - 1.3	.03 - .15	0.7 - 1.8	.05 - .13	.1 - .8	.06 - .29	<.01 - .03	2 - 8	17 - 60
Oct	0.2 - 2.3	.06 - .18	0.6 - 3.7	.08 - .16	.3 - .7	.20 - .32	.01 - .03	2 - 9	14 - 46
Nov	0.3 - 3.7	.08 - .45	1.6 - 5.4	.08 - .19	.3 - .7	.17 - .28	<.01 - .04	5 - 17	17 - 47
Dec	0.5 - 3.2	.07 - .37	1.2 - 4.3	.09 - .17	.3 - .6	.12 - .35	<.01 - .07	4 - 12	15 - 50
Jan	0.5 - 3.7	.10 - .38	1.4 - 3.9	.12 - .18	.4 - .6	.20 - .34	<.01 - .01	4 - 9	15 - 34
Feb	0.6 - 2.0	.11 - .34	1.3 - 4.0	.08 - .16	.4 - .8	.15 - .33	<.01 - .06	4 - 8	14 - 32
Mar	0.4 - 1.9	.08 - .36	0.8 - 3.4	.06 - .14	.3 - .6	.11 - .42	<.01 - .02	5 - 10	21 - 52
Apr	0.5 - 1.9	.08 - .35	0.8 - 3.4	.05 - .17	.4 - .8	.19 - .41	<.01 - .04	4 - 7	11 - 51
May	0.4 - 1.7	.08 - .24	0.8 - 3.2	.06 - .15	.4 - .8	.15 - .230	<.01 - .10	3 - 6	9 - 38
Jun	0.3 - 1.0	.09 - .21	0.9 - 2.9	.09 - .12	.4 - .7	.25 - .39	<.01 - .06	1 - 4	11 - 25
Jul	0.4 - 1.2	.05 - .11	1.2 - 3.0	.07 - .10	.5 - .7	.22 - .30	<.01 - .09	3 - 4	25 - 44
Aug	0.2 - 1.2	.03 - .17	0.6 - 3.2	.05 - .13	.3 - .5	.13 - .27	<.01 - .03	1 - 7	12 - 43

REGION: AR, DD, DN, KN, VR

SPECIES: *Urochloa mosambicensis*
COMMON NAME: Sabi grass
CULTIVAR: Nixon
PLANT PART: Tops

	NUTRIENT CONCENTRATION RANGE				
MONTH	**B**	**Fe**	**Mn**	**Mo**	**Cl**
Sep	1 - 7	86 - 392	92 - 236		
Oct					
Nov	2 - 9	334	124 - 214		
Dec	1 - 9	102 - 419	96 - 200	1.6	
Jan	6	100 - 584			
Feb			144	.4	
Mar	1 - 7	103 - 367	136 - 336	.4 - 1.6	
Apr	5 - 10	94 - 249	166 - 191		
May	4 - 7				
Jun					
Jul					
Aug	4 - 9	88 - 335	126 - 286		

REGION: AR, DD, KN,

SPECIES: *Urochloa mosambicensis*
COMMON NAME: Sabi grass
CULTIVAR: Nixon
PLANT PART: Leaf

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.9 - 2.2	.07 - .39	1.9 - 2.2	.05 - .07					
Oct	1.0 - 3.4	.21	1.9	.23	.6	.47	1.1	11	31
Nov	3.7 - 4.0	.36							
Dec	2.9 - 3.2	.18 - .30							
Jan	2.0 - 3.4	.23 - .44							
Feb	2.9 - 3.1	.28 - .58							
Mar	2.4 - 2.5	.25 - .53							
Apr	1.3 - 2.4	.12 - .32		.07 - .08					
May	1.3 - 2.1	.19 - .24	2.8	.10	.6	.20	.01	4	14
Jun	1.2 - 2.2	.17 - .19	2.3 - 3.0						
Jul	0.7 - 2.2	.08 - .19	2.2	.04 - .08	1.0	.19	<.01	3	11
Aug	0.8 - 1.8	.09 - .18	1.8 - 2.0						

REGION: AR, DD, KN, VR

SPECIES: *Urochloa mosambicensis*
COMMON NAME: Sabi grass
CULTIVAR: Nixon
PLANT PART: Stem

	NUTRIENT CONCENTRATION RANGE								
MONTH	**N**	**P**	**K**	**S**	**Ca**	**Mg**	**Na**	**Cu**	**Zn**
Sep	0.2 - 1.1	.03 - .08		.03					
Oct									
Nov									
Dec									
Jan									
Feb									
Mar									
Apr	0.5	.13		.06					
May									
Jun	0.6	.12	2.8						
Jul	0.4	.14							
Aug	0.8	.05	1.6						

REGION: DD, KN

MISCELLANEOUS GRASSES

Capillipedium parviflorum; Scented top (CU)
Tops: Nov: N 1.0; P .08; K 1.1; S .09; Ca .4; Mg .17; Na <.01; Cu 6; Zn 28

Chionachne sp. (VR)
Tops: Mar: N 1.2; P.11; K 1.7; S .18; Ca .2; Mg .17; Na < .01, Zn 23

Panicum antidotale; Blue panic (DN, DW)
Tops: N: Jan 1.4 - 1.5; Feb 1.7; Mar 1.1 - 1.7; Jun 1.8

Panicum paludosum; Swamp panic; (FL)
Tops: Oct: N 2.4; P .34; K 2.5; S .23; Ca .2; Mg .19; Na .44; Cu 11; Zn 31; B 8; Mn 108; Fe 340

Paspalidium rarum (AR)
Regrowth: Oct: N 2.9; P .15; K 3.0; S .18; Ca .2; Mg .31; Na .10; Cu 8; Zn 39

Paspalum dilatatum; Paspalum; (DN)
Tops: N: Jan .9 - 1.0; Feb .8 - 1.0; Mar .8

Pennisetum clandestinum; Kikuyu grass (CU)
Tops: Jun: N 1.1 - 1.7; P .06 - .11; K .6 - 1.8

Phragmites karka; Tropical reed (FL)
Tops: Aug: N 1.2; P .10; K 1.8; S .43; Ca .2; Mg .14; Na .08; Cu 3; Zn 16

Sorghum laxiflorum (CU)
Tops: April: N .8; P .18; K 1.2; S .08; Ca .3; Mg .20; Na .01; Cu 4

Whiteochloa airoides (DD)
Tops: Nov: N 1.5; P .08; K 2.4; S .12; Ca .3; Mg .20; Na <.01; Cu 5; Zn 19

SPECIES:
COMMON NAME:
CULTIVAR:
PLANT PART:

MONTH	NUTRIENT CONCENTRATION RANGE				
	B	Fe	Mn	Mo	Cl
Sep					
Oct					
Nov					
Dec					
Jan					
Feb					
Mar					
Apr					
May					
Jun					
Jul					
Aug					

REGION: