NUTRIENT MANAGEMENT GUIDELINES FOR SUGARCANE IN THE ROCKY POINT DISTRICT

Ameliorants

Table 1 – Lime guidelines for acid soils (when pH water < 5.5)

CEC (meq/100g)	Lime application (tonnes/ha)
0 – 4.0	1.25
4.0 – 8.0	2.5
8.0 – 16.0	4
> 16.0	5

Table 2 – Lime guidelines based on exchangeable soil calcium (Ca)

Soil calcium (meq/100g)	Lime application (tonnes/ha)
< 0.2	4
0.2 – 0.4	3.5
0.4 – 0.6	3
0.6 – 0.8	2.5
0.8 – 1.2	2
1.2 – 1.6	1.5
1.6 – 2.0	1.0
> 2	0

Table 3 – Magnesium (Mg) guidelines based on exchangeable Mg

Soil Mg (amm-acet) meq/100g	< 0.05	0.06 – 0.10	0.11 – 0.15	0.16 – 0.20	0.21 – 0.25	> 0.25
Mg rate (kg/ha)	150	125	100	75	50	0

Table 4 – Silicate guidelines based on reserves and available soil silicon (Si)

	Si (BSES/sulphuric acid)		Si (CaCl)	Suggested application rate
Si (mg/kg)	< 70	and	< 10	Mud/ash at 100-150 wet t/ha

Table 5 – Gypsum guidelines for sodic soils

ESP (%)	Gypsum rate (tonnes/ha)
< 5	0
5 - 10	2
10 - 15	4
> 15	6

Table 6 – Modifications to ameliorant application rates where mill by-products have been applied

Product	Application rate	Reduce the next Ag lime application by:	Magnesium (Mg)
Mill mud	100 wet tonnes/ha	2 t/ha	Sufficient Mg for one crop cycle
	150 wet tonnes/ha	2 t/ha	Sufficient Mg for one crop cycle

Nitrogen (N)

Table 7 – Nitrogen (N) fertiliser guidelines

District Yield Potential	Crop	All soils except acid peat soils – Organic C (%), N mineralisation index and N application rate (kg/ha)							Acid Peat soils – Organic C (%), N mineralisation index and N application rate (kg/ha)		
		< 0.4	0.4 – 0.8	0.8 – 1.2	1.2 – 1.6	1.6 – 2.0	2.0 – 2.4	> 2.4	< 3.0	3.0 – 6.0	> 6.0
		VL	L	ML	M	MH	H	VH	L	M	H
120 tc/ha	Plant	140	130	120	110	100	90	80	140	130	120
	Replant and ratoon	160	150	140	130	120	110	100	160	150	140

Note: The following criteria are used to categorise a soil as an Acid Peat in the Rocky Point District:

1. pH (water) is < 5.5
2. Organic C (%) is > 2
3. Sulphate S (mg/kg) is > 200

Table 8 – Calculation of Nitrogen (N) rate discount following a legume crop

Legume crop	N%	Crop dry mass (t/ha)	N discount if cover crop (kg/ha)	N discount if grain harvested (kg/ha)
Soybean	3.5	8	360	120
		6	270	90
		4	180	60
		2	90	30
Cowpea	2.8	8	290	100
		6	220	75
		4	145	50
		2	70	25
Lablab	2.3	8	240	80
		6	180	60
		4	120	40
		2	60	20

Table 9 – Modifications to nitrogen (N) application rate where mill by-products have been applied

Product	Application rate	To be subtracted from the appropriate N application rate (kg/ha)		
		Year 1	Year 2	Year 3
Mill mud	100 wet tonnes/ha	50	25	0
	150 wet tonnes/ha	80	40	20

Notes for determining appropriate N application rate

1. Determine baseline N rate from Table 7 by using the Organic C (%) value to determine N mineralisation index and N requirement for crop.
2. Calculate N rate discount for sugarcane crops that follow a legume crop, using Table 8.
3. If mill by-products were applied prior to planting, use Table 9 to determine N rate discount for the N contribution from mill mud and mud/ash mixture.

Example 1.
The Organic C value is 0.8%, the N mineralisation index is low (L), a crop of soybeans was grown with an estimated 6 t/ha dry mass that was harvested for grain.
The calculation for the N requirement for a plant crop using the replant rate to establish baseline N rate: *150 – 90 = 60 kg N/ha*

Example 2.
The Organic C value is 0.8%, the N mineralisation index is low (L) and a mud/ash mixture was applied to the fallow block at 150 wet tonnes/ha.
N requirement for year 1: *130 – 50 = 80 kg N/ha*
N requirement for year 2: *150 – 20 = 130 kg N/ha*
N requirement for year 3: *150 – 10 = 140 kg N/ha*

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Phosphorus

Table 10 – Phosphorus (P) fertiliser guidelines

PBI	P sorption class	Crop	BSES P (mg/kg) range and P application rate kg/ha								
			< 5	5 - 10	10 - 20	20 - 30	30 – 40	40 - 50	50 - 60	60 - 120	> 120
> 420	Very high	Plant and replant	80	50	40	30	30	30	30	30	0
		Ratoon	40	40	30	25	20	20	20	20	0
281 - 420	High	Plant and replant	80	50	40	30	20	20	0	0	0
		Ratoon	40	40	30	25	20	10	0	0	0
140 - 280	Moderate	Plant and replant	60	40	30	20	20	20	0	0	0
		Ratoon	30	30	20	20	15	5	0	0	0
< 140	Low	Plant and replant	40	30	30	20	20	20	0	0	0
		Ratoon	20	20	15	10	10	0	0	0	0

Table 11 – Modifications to phosphorus (P) application rate where mill by-products have been applied

Product	Application rate	P contribution
Mill mud	100 wet tonnes/ha	Sufficient P for one crop cycle
	150 wet tonnes/ha	Sufficient P for two crop cycles

Potassium (K)

Table 12 – Potassium (K) fertiliser guidelines

Nitric K (meq/100g)	Texture	Crop	Exchangeable K (meq/100g) K application rate (kg/ha)						
			< 0.20	0.20 – 0.25	0.26 – 0.30	0.31 – 0.35	0.36 – 0.40	0.41 – 0.45.	> 0.45
< 0.70	Sand	Plant	100	80	50	50	0	0	0
		Replant and ratoon	120	120	100	80	50	0	0
	Loam	Plant	120	100	80	50	0	0	0
		Replant and ratoon	120	120	100	100	80	50	0
	Clay	Plant	120	120	100	80	50	0	0
		Replant and ratoon	120	120	100	100	100	80	0
> 0.70	Sand	Plant	80	50	0	0	0	0	0
		Replant and ratoon	100	100	80	50	0	0	0
	Loam	Plant	100	80	50	0	0	0	0
		Replant and ratoon	100	100	100	80	50	0	0
	Clay	Plant	100	100	80	50	0	0	0
		Replant and ratoon	100	100	100	100	80	50	0

Table 13 – Modifications to potassium (K) application rate where mill by-products have been applied

Product	Application rate	To be subtracted from the appropriate K application rate (kg/ha)	
		Year 1	Year 2
Mill mud	100 wet tonnes/ha	25	0
	150 wet tonnes/ha	40	0

Sulfur (S)

Table 14 – Sulfur fertiliser guidelines

For all soils except acid peat soils		Acid peat soils		
Sulfate-S (mg/kg)	S application rate (kg/ha)	S application rate based on N mineralisation categories (kg/ha)		
		L	M	VH
< 5	25	25	20	15
5 – 10	15	15	10	5
11 – 15	10	10	5	0
> 15	0	0	0	0

Table 15 – Modifications to sulfur (S) application rate where mill by-products have been applied

Product	Application rate	To be subtracted from the appropriate S application rate (kg/ha)		
		Year 1	Year 2	Year 3
Mill mud	100 wet tonnes/ha	5	5	5
	150 wet tonnes/ha	10	10	10

Micronutrients

Table 16 – Copper (Cu) fertiliser guidelines

Copper (DTPA)	Application rate
< 0.2 mg Cu/kg	10 kg Cu/ha once per crop cycle

Table 17 – Zinc (Zn) fertiliser guidelines

Zinc (HCL)	Application rate
< 0.6 mg Zn/kg	10 kg Zn/ha once per crop cycle

These guidelines summarise information contained in the SIX EASY STEPS® district specific Nutrient Management program.
This resource is made available by the SIX EASY STEPS Research and Development team. It was developed through project funding from several sources over an extended period.

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