

# NUTRIENT MANAGEMENT GUIDELINES FOR SUGARCANE IN THE BURDEKIN DISTRICT

## Ameliorants

**Table 1 – 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
> 2.0	0

**Table 2 – 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 3 – Gypsum guidelines for sodic soils**

ESP (%)	Gypsum rate (tonnes/ha)
< 5	0
5 - 10	5
10 - 15	7.5
> 15	10

**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 200 wet t/ha

**Table 5 – Modifications to ameliorant application rates where mill by-products have been applied**

Product	Application rate	Reduce the next lime application by:	Magnesium (Mg)
Mill ash	200 wet tonnes/ha	2.5 t/ha	Sufficient Mg for one crop cycle
Mill mud	200 wet tonnes/ha	2.5 t/ha	Sufficient Mg for one crop cycle
Mud/ash mixture	200 wet tonnes/ha	2.5 t/ha	Sufficient Mg for one crop cycle

## Nitrogen (N)

**Table 6 – Nitrogen (N) fertiliser guidelines**

District	Yield Potential	Crop	Organic C (%) range, N mineralisation index and N application rate (kg/ha)						
			< 0.40	0.41 – 0.80	0.81 – 1.20	1.21 – 1.60	1.61 – 2.00	2.01 – 2.40	> 2.40
			VL	L	ML	M	MH	H	VH
150 tc/ha		Plant after bare fallow	150	140	130	120	110	100	90
		Replant and ratoon	190	180	170	160	150	140	130
180 tc/ha		Plant after bare fallow	180	170	160	150	140	130	120
		Replant and ratoon	220	210	200	190	180	170	160

**Table 7 – 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
Peanut	3.0	8	N/A	125
		6		100
		4		65
		2		25
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 8 – Modifications to nitrogen (N) rate where mill by-products have been applied**

Product	Application rate	To be subtracted from the appropriate N application rate		
		Year 1	Year 2	Year 3
Mill ash	200 wet tonnes/ha	Nil	Nil	Nil
Mill mud	200 wet tonnes/ha	100 kg N/ha	50 kg N/ha	25 kg N/ha
Mud/ash mixture	200 wet tonnes/ha	60 kg N/ha	30 kg N/ha	15 kg N/ha

**Note:** Modifications to N rate are recommended where blocks of cane are irrigated with ground and tail water which may contain substantial amounts of nitrate. The N application needs to be reduced to take this source of N into account.

### Notes for determining appropriate N application rate

- Determine baseline N rate from Table 6 by firstly selecting appropriate DYP, then use the Organic C (%) to determine N mineralisation index and N requirement for crop.
- Calculate N rate discount for sugarcane crops that follow a legume crop, using Table 7.
- If mill by-products were applied prior to planting, use Table 8 to determine N rate discount for the N contribution from mill mud and mud/ash mixture.

### Examples:

- 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:  $210 - 90 = 120$  kg N/ha
- 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 200 wet tonnes/ha.  
N requirement for year 1:  $170 - 60 = 80$  kg N/ha, N requirement for year 2:  $210 - 30 = 180$  kg N/ha and N requirement for year 3:  $210 - 15 = 195$  kg N/ha

