Field Prescription Application Rates

Field ID:	NW10-07-06EPM	
Land Area Available (ha):		23
2016 Crop	Soybeans	
2016 Target Yield:	35 bu/ac	
	lb/ac	kg/ha
Target Nitrogen recommended :	50	56
Fertilizer Phosphate (P2O5) Recommended:	35	39.2
1 x P2O5 Crop Removal @ target Yield:	30	33.6
2 x P2O5 Crop Removal @ target Yield:	60	67.2

Plant Available Nutrients Soil Test Data			
Sample Depth	0-15 cm	15-60 cm	Total Available
Units	mg kg^{-1}		kg ha-1
Available Nitrate-N	17.5	15.7	129
Available Phosphate-P	06.4		13
Available Potassium	368		736
Available Sulfate-S	800	1800	12,400

Steinbach Biosolids Characteristics and Analysis

Parameter Name	Parameter Description	Unit	Biosolid Analysis (Cell 2)
Estimated Biosolid Volume (+ 10% safety volume)	In-field	m^3	(3,739)
Specific Gravity	As Received	kg L^{-1}	1.03
Estimated Biosolids		tonnes	- 3,851
Dry tonnes biosolids available (=wet tonnes x %solids)	Dried Basis	tonnes	(329)
Moisture	As Received	%	89.80
Total Solids	As Received	%	8.80
Total Volatile Solids	Dry Basis	%	30
Organic Matter	Dry Basis	%	17.00
Mineral Content	Dry Basis	%	83.00
Total Organic Carbon	Dry Basis	%	2.00
C:N Ratio	Dry Basis	x:1	17.24
C:P Ratio	Dry Basis	x:1	4.34
N:P Ratio	Dry Basis	x:1	0.25
pH	Saturated Paste		6.87
Total Kjeldahl N	% Dried Basis	%	0.12
Total Kjeldahl N	Dried Basis	mg kg^{-1}	1,160
Total Kjeldahl N	Dried Basis	kg Tonne^{-1}	1.16
Ammonium - N	Dried Basis	mg kg^{-1}	397.00
Ammonium - N	Dried Basis	kg Tonne^{-1}	0.3970
Available Nitrate	Dried Basis	mg kg^{-1}	-
Available Nitrate-N	Dried Basis	mg kg^{-1}	-
Available Nitrate-N		kg Tonne^{-1}	-
Total Phosphorous	Dried Basis	mg kg^{-1}	4,610

Amount of Biosolids Nutrient Available to Crop

Organic N (=TKN-ammonium N)	Dried Basis	mg kg^{-1}	763.00
Organic N	Dried Basis	kg Tonne^{-1}	0.76
Method of Application:			Injections
Anticipated Weather			Cool/dry
Anticipated Volatilization (%)	incorp within 1 days		15
Available Organic N	Dried Basis	kg Tonne^{-1}	0.19
Ammonium nitrogen available	Dried Basis	kg Tonne^{-2}	0.34
Total available nitrogen (Year 1) (@25%)	Dried Basis	kg Tonne^{-1}	0.53
Mineralization N Year 2 (@12%)	Dried Basis	kg Tonne^{-1}	0.09
Mineralization N Year 3 (@6%)	Dried Basis	kg Tonne^{-1}	0.05
Phosphorus	Dried Basis	kg Tonne^{-1}	4.61
P$_2$O$_{5 equivalent}$	Dried Basis	kg Tonne^{-1}	10.60
Total Available P2O5	Dried Basis	kg Tonne^{-1}	5.30

Application Rate based on Nitrogen				**Land Area Required (Ha)**
Nitrogen Based Application Rate	Dried Basis	tonnes ha^{-1}	106.02	**-3**
Amount of Available P2O5 applied	Dried Basis	kg ha^{-1}	562.07	
P2O5 Application check		%	1,433.85	
Application Rate based on Phosphorous (1xCR)				**Land Area Required (Ha)**
Total Phosphorus Based Application Rate	Dried Basis	tonnes ha^{-1}	6.34	**-52**
Amount of Nitrogen applied	Dried Basis	kg ha^{-1}	3.35	
Additional Nitrogen required		kg ha^{-1}	52.65	
Application Rate based on Phosphorous (2xCR)				**Land Area Required (Ha)**
Total Phosphorus Based Application Rate	Dried Basis	tonnes ha^{-1}	12.68	**-26**
Amount of Nitrogen applied	Dried Basis	kg ha^{-1}	6.70	
Additional Nitrogen required		kg ha^{-1}	49.30	

Selected Application rate based on:		**2xCR**	**P2O5**
Selected Application rate based on P2O5	Dried Basis	tonnes ha^{-1}	12.68
		tons ac^{-1}	5.70
	Wet	tonnes ha^{-1}	144.04
		tons ac^{-1}	64.82
Estimated Biosolids Volume Applied	Wet	Tonnnes	3,313
Estimated Biosolids Volume Remaining	Wet	Tonnes	- 7,164

Notes

Available Ammonium N - Volatilization loss associated with different application methods (0% with Injection)

Organic N - TKN - Ammonium N

Available Organic N - Organic N x 0.25year 1

Mineralization of Year 2 = 12%, Year 3 = 6%

Plant Available Nitrogen= (NO3-N)+Volatilization factor (NH4-N)+Organic N Mineralization

Phosphorous Total and Olsen methods.

* See Estimates of Ammonium-N Retained After Biosolids application

C:N exceeds 30:1, N becomes a limiting nutrient for decomposer organisms, and this can reduce the rate of decomposition and

C:P ratio between 200:1 and 300:1, mineralization and immobilization balance each other to result in no net release of P from the

When animal and municipal wastes have N:P ratios ranging from 1:1 to 1:2 are applied based on N rates on soils, over time P will