

Field Prescription Application Rates

Field ID:	NE08-07-06EPM	
Land Area Available (ha):		25
2016 Crop	Winter Wheat	
2016 Target Yield:	80 bu/ac	
	lb/ac	kg/ha
Target Nitrogen recommended :	20	22.4
Fertilizer Phosphate (P2O5) Recommended:	15	16.8
1 x P2O5 Crop Removal @ target Yield:	25	28
2 x P2O5 Crop Removal @ target Yield:	50	56

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	12.0	10.5	87
Available Phosphate-P	65.0		130
Available Potassium	305		610
Available Sulfate-S	900	1000	7,800

Steinbach Biosolids Characteristics and Analysis

Parameter Name	Parameter Description	Unit	Biosolid Analysis (Cell 2)
Estimated Biosolid Volume (+ 10% safety volume)	In-field	m ³	(717)
Specific Gravity	As Received	kg L ⁻¹	1.03
Estimated Biosolids		tonnes	- 738
Dry tonnes biosolids available (=wet tonnes x %solids)	Dried Basis	tonnes	(63)
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 Phosphorus	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	42.41	-1
Amount of Available P2O5 applied	Dried Basis	kg ha ⁻¹	224.83	
P2O5 Application check		%	1,338.26	
Application Rate based on Phosphorous (1xCR)				Land Area Required (Ha)
Total Phosphorus Based Application Rate	Dried Basis	tonnes ha ⁻¹	5.28	-12
Amount of Nitrogen applied	Dried Basis	kg ha ⁻¹	2.79	
Additional Nitrogen required		kg ha ⁻¹	19.61	
Application Rate based on Phosphorous (2xCR)				Land Area Required (Ha)
Total Phosphorus Based Application Rate	Dried Basis	tonnes ha ⁻¹	10.56	-6
Amount of Nitrogen applied	Dried Basis	kg ha ⁻¹	5.58	
Additional Nitrogen required		kg ha ⁻¹	16.82	

Selected Application rate based on:		2xCR	P2O5
Selected Application rate based on P2O5	Dried Basis	tonnes ha ⁻¹	10.56
		tons ac ⁻¹	4.75
	Wet	tonnes ha ⁻¹	120.03
		tons ac ⁻¹	54.02
Estimated Biosolids Volume Applied	Wet	Tonnes	3,001
Estimated Biosolids Volume Remaining	Wet	Tonnes	- 3,739

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 soil. 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