Biosolids Plant Available Nitrogen (PAN) & Agronomic Application Rate Calculation Worksheet

NOTE: Gray Cells Require User Input

1 Calculate Biosolids Organic Nitrogen (%TKN - (%$NH_{3/4}$-N)

Note: if in mg/Kg (ppm) convert to % (pph) before entry (mg/Kg/10,000 =%)

%TKN	3.60
- %NH_4-N	2.10
= %Org-N	1.50

2 Biosolids %$NH_{3/4}$-N Remaining after Volatilization [(%$NH_{3/4}$(fv/100))]

Estimated NH_3 Retained (fv) %					
Days to Incorporate	Surface-applied				Injected
	Liquid Biosolids	Dewatered Biosolids	Alkaline Stabilized	Compost or Air Dried	All Biosolids
0 to 2	50 - 80	55 - 85	10	100	100
3 to 6	30 - 65	45 - 75	10	100	100
over 6+	10 - 35	20 - 45	10	100	100

%NH_4-N	2.10
x (fv)	50
= %avail NH_4-N	1.05

3 Biosolids %Org-N Mineralized in first year [(%Org N x (fm/100))]

1st Year Estimated Mineralization Rate (fm)		
Processing	Moisture Content	Est. of first year Mineralization
Anaerobic digestion	liquid	20-40
Aerobic digestion	liquid	30-45
Aerobic/anaerobic digestion	liquid	15-30
storage in lagoon > 6 months	liquid	15-30
Anaerobic digestion & dewatering	semi-solid	25-32
Drying bed	solid	15-30
Heat-dried	solid	20-40
Compost	solid	0-20
CSU Average		27

%Org-N	1.50
x (fm)	30
= %avail Org-N	0.45

4 TOTAL % Available N from Biosolids

= %NO_3-N + %avail NH_4-N + %avail Org-N

%NO_3-N	0.02
+ %avail NH_4-N	1.05
+ %avail Org-N	0.45
= %avail N	1.52

5 Plant Available Nitrogen (PAN) per Dry Ton of Biosolids

= [(% Available N)/(100)](2000 lbs per ton)

= (% Available N)(20)

%avail N	1.52
x 20	20.00
= lbs PAN/dt	30.40

6 Soil - available N

# N available in Soil	0.00
# N available from previous biosolids applications	0.00
Fertilizer recommendation	75.00

7 Crop N requirement (lbs.N/ acre)

N requirement from biosolids	75.00

8 Biosolids Agronomic Application Rate, dry tons/acre

dt/ac	**2.47**

9 Biosolids Agronomic Application Rate

wet tons/ac = [(dt/ac)/(%TS)]100

gallons/ac = [(dt/ac)(2000)/(8.34)(%TS)]100

Biosolids % Total Solids: 27.00

wet tons/ac	**9.1**
gallons/ac	**2,191**