

Total Annual Application – Should not exceed the maximum annual or biennial rates per field as stated in Appendix 5 of the Texas Nutrient Management Standard (590) or Table 2 or 2a of the 590 Organic Nutrient Management Plan.

Maximum Hourly Application Rate - The maximum hourly application rate is determined by the texture of the soil layer with the lowest permeability within the upper 24 inches of the predominant soil in each field. *The hourly application rate must be low enough to avoid runoff and/or ponding.* For effluent with 0.5% solids or less do not exceed the rates shown in **Table 1**. If the effluent contains more than 0.5% solids the Table 1 values must be reduced by the appropriate amount shown in **Table 2**.

Table 1 – Maximum Application Rate (in/hr)

Soil Texture	Application amount in inches						
	0.25	0.50	0.75	1.00	1.25	1.50	2.00
Sand	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Loamy sand	6.00	6.00	4.83	4.22	3.86	3.62	3.32
Sandy loam	4.91	2.97	2.32	1.99	1.80	1.67	1.51
Loam	3.11	1.69	1.21	0.98	0.84	0.74	0.62
Silt loam	2.70	1.45	1.03	0.82	0.70	0.61	0.51
Sandy clay loam	1.74	0.96	0.69	0.56	0.48	0.43	0.37
Clay loam	1.27	0.68	0.48	0.39	0.33	0.29	0.24
Silty clay loam	1.09	0.57	0.40	0.32	0.26	0.23	0.19
Sandy clay	0.61	0.33	0.23	0.19	0.16	0.14	0.12
Silty clay	0.84	0.44	0.30	0.24	0.20	0.17	0.14
Clay	0.39	0.21	0.14	0.11	0.09	0.08	0.07

NOTE: This table is for infiltration for full cover conditions and initial moisture content at 50 percent of available water capacity. Field capacity of sand through sandy loam is assume to be 1/10 bar.

Table 2 – Reduction Coefficients by Percent Solids

Soil Texture	Percent Solids (by wt)						
	0.50	1.0	2.0	3.0	5.0	7.0	10.0
Sand	0.88	0.55	0.31	0.22	0.13	0.10	0.07
Loamy sand	0.70	0.54	0.37	0.28	0.19	0.14	0.10
Sandy loam	0.87	0.77	0.63	0.53	0.40	0.32	0.25
Loam	0.97	0.93	0.88	0.83	0.74	0.67	0.59
Silt loam	0.98	0.95	0.91	0.87	0.81	0.75	0.68
Sandy clay loam	0.99	0.97	0.95	0.92	0.87	0.83	0.78
Clay loam	0.99	0.99	0.98	0.97	0.94	0.92	0.89
Silty clay loam	1.00	1.00	0.99	0.99	0.98	0.97	0.96
Sandy clay	1.00	1.00	1.00	1.00	0.99	0.99	0.99
Silty clay	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Clay	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Maximum One-time Application Rate - The maximum amount of effluent that can be applied to a field at anyone time is the amount that will bring the top 24 inches of the soil to its available water holding capacity which is the maximum amount of plant available water that can be held by the soil against the forces of gravity. The available water capacity (AWC) of upper 24 inches of the predominant soil in each field should be used. The AWC of the upper 24 inches of the profile may be calculated from AWC data in Section II of the NRCS Field Office Technical Guide, or Soil Survey.

To determine any one-time application amount the current soil moisture level of the upper 24 inches of the predominant soil in the field should be estimated using the guidance in **Table 3**. Several random samples of the upper 24” should be pulled and evaluated to determine average conditions. Additional information on estimating soil moisture can be found in the NRCS Program Aid 1619, Estimating Soil Moisture by Feel and Appearance, or from the University of Nebraska Extension publication, No. G84-690-A, by the same name. Both of these publications have pictures of various soils at different AWC to be used as a guide to estimating soil moisture.

Once the current moisture of the upper 24 inches is estimated it is subtracted from the AWC of the upper 24 inches and the difference is the maximum application for those soil conditions on that day. Remember, the maximum hourly application and the maximum one time application rates are only estimates to be used as a guide. The gallon figures in Table 3 are estimates of the amount of effluent that can be applied to bring the soil to full AWC without runoff, ponding or excessive leaching. No runoff or ponding should occur during application, so frequent observations should be made during each application to ensure that these conditions are met.

Table 3 - Maximum one time Application Rates Based on AWC

Available Moisture in the Soil	Sands and Loamy Sands <i>1, 3/</i>	Sandy Loam and Fine Sandy Loam <i>1,2,3/</i>	Very Fine Sandy Loam, Loam, Silt Loam, Silty Clay Loam <i>2,3/</i>	Sandy Clay, Silty Clay, Clay, Fine and Very Fine Textured Soils <i>2,3/</i>
<25 % Soil Moisture	Dry, loose and single-grained; flows through fingers.	Dry and loose; flows through fingers.	Powdery dry; in some places slightly crusted but breaks down easily into powder.	Hard, baked and cracked; has loose crumbs on surface in some places.
Amount to Reach AWC	20,000 gallons per acre	20,000 gallons per acre	40,000 gallons per acre	27,000 gallons per acre
	0.74 acre inches	0.74 acre inches	1.48 acre inches	1.0 acre inch
25-50% Soil Moisture	Appears to be dry; does not form a ball under pressure.	Appears to be dry; does not form a ball under pressure.	Somewhat crumbly but holds together under pressure.	Somewhat pliable; balls under pressure.
Amount to Reach AWC	15,000 gallons per acre	20,000 gallons per acre	30,000 gallons per acre	20,000 gallons per acre
	0.55 acre inches	0.74 acre inches	1.1 acre inches	0.74 acre inches
50 to 75% Soil Moisture	Appears to be dry; does not form a ball under pressure.	Balls under pressure but seldom holds together.	Forms a ball under pressure; somewhat plastic; sticks slightly under pressure.	Forms a ball; ribbons out between thumb and forefinger.
Amount to Reach AWC	10,000 gallons per acre	13,000 gallons per acre	20,000 gallons per acre	13,000 gallons per acre
	0.37 acre inches	0.48 acre inches	0.74 acre inches	0.48 acre inches
75% to Field Capacity	Sticks together slightly; may form a weak ball under pressure.	Forms a weak ball that breaks easily, does not stick.	Forms ball; very pliable; sticks readily if relatively high in clay.	A ribbon out between fingers easily; has a slick feeling.
Amount to Reach AWC	5,000 gallons per acre	7,000 gallons per acre	11,000 gallons per acre	7,000 gallons per acre
	0.18 acre inches	0.26 acre inches	0.41 acre inches	0.26 acre inches
100% Field Capacity	On squeezing, no free water appears on soil, but wet outline of ball on hand.	On squeezing, no free water appears on soil, but wet outline of ball on hand.	On squeezing, no free water appears on soil, but wet outline of ball on hand.	On squeezing, no free water appears on soil, but wet outline of ball on hand.
Above Field Capacity	Free water appears when soil is bounced in hand.	Free water is released with kneading.	Free water can be squeezed out.	Puddles: free water forms on surface.

Source: USDA-Natural Resources Conservation Service (NRCS), *Ohio Field Office Technical Guide*.

1/ Rate will be one half the maximum if, the field and crop has a high leaching potential and shallow groundwater (<100 ft.) is present.

2/ Rate will be one half maximum if, the predominant field slope is 5 to 8 percent.

3/ Remember these are just estimated maximum application rates and that any one time application must cease if ponding and/or runoff occur.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's [TARGET Center](#) at 202-720-2600 (voice and TDD).

To file a complaint of discrimination write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call 202-720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.