Nitrogen Loading Ratios

Data summary of Relative NO3-N Loading Estimates for Phase 6.0 Land Uses J.J. Meisinger 9-8-15

	P6 Landuse	Wtd. Avg. (#obs.); Rel. to Corn, no Man.	Std Err. Mean; (# df) pooled across all obs.
1	**Corn or sorghum grain - elig. for manure** (1, 2, 3, 10, 11)	1.40 (12)	0.20 (7)
2	**Corn or sorghum silage - elig. for manure** (10)	1.62 (1)	NA
3	**Corn or sorghum grain - no manure**	1.00 (NA)	NA
4	**Corn or sorghum silage - no manure** [1]	1.16 (NA)	NA
5	**Sm gr w/ soybean dbl.cr. - no manure** (9)	0.79 (2)	0.09 (1)
6	**Full season soybean - no manure** (3, 10, 45)	0.71 (6)	0.11 (2)
7	**Sm gr w/ forage establ. - elig. for manure** [2]	0.84 (NA)	NA
8	**Other Agronomic Crops (cotton, tob., peanuts)** (15)	0.45 (1)	NA
9	**Pasture - direct dep; elig. for manure** (12, 13, 14)	0.23 (10)	0.06 (4)
10	**Legume (or legume-grass mix) Hay** (6, 7)	0.17 (4)	0.02 (2)
11	**Other Hay (perennial grasses, Or. Grass, T. fescue)** (12, 13)	0.24 (4)	0.06 (2)
12	**Ag open space (per. grasses, Or. Grass, T. fescue)** (8)	0.10 (2)	0.01 (1)
13	**Specialty- high input (potatoes, sweet corn, etc.)** (10)	1.34 (1)	NA
14	**Specialty - Low input (orchard, nursery st., peas)** [3]	0.31 (NA)	NA

Notes: [1] Est. from ratio (Corn/Sor. Silage w/ man.)/(Corn/Sor. Grain w/ man.) = 1.62/1.4 = 1.16

[2] Est. from Sm gr w/ sb dc w/o manure, adjusted to only Sm gr, plus a w/ manure factor. First estimate sb dc factor, with dc Sb = 50% of Full Sea. Sb, so Sm gr alone = 0.79 - (0.71/2) = 0.44. Then, Sm gr w/ manure factor = 0.44 + (corn w/ man. - corn gr w/o man.) = 0.44 + (1.40 -1.00) = 0.84

[3] Est. from Other Hay + 0.07 (due to greater loading w/ annuals) = 0.24 + 0.07 = 0.31

Relative NO3-N Data Sources

Source #	Citation
1:	Jemison & Fox, 1994, JEQ 23:337-343
2:	Roth & Fox, 1990, JEQ 19:243-248
3:	Ritter et al., 1990, J Irr & Drain Eng. 116:738-351
4:	Zhu & Fox, 2003, Agron. J. 95:1028-1033
5:	Parkin & Meisinger, 1989, JEQ 18:12-16 ; Meisinger Pers. Comm. (from deep soil cores)
6:	Toth & Fox, 1998, JEQ 27:1027-1033
7:	Owens, 1987, JEQ 34:34-38; Chichester, 1977, JEQ 6:211-217
8:	Angle, et al., 1989, Agr. Ecosys. & Environ. 25:279-286
9:	Spargo, 2009, Agron Abst. Poster & Pers. Comm.
10:	Staver, 2009, Pers. Comm. (from deep soil cores)
11:	Angle, et al., 1993, JEQ 22:141-147
12:	Stout et al., 2000, Agr. Ecosys. & Environ. 77:203-210
13:	Jabro et al., 1997, JEQ 26:89-94
14:	Owens et al., 2012, JEQ 41:106-113
15:	Wilson et al., 1995, Am. Soc. Agr. Eng. Spec. Pub. Clean Water, Clean Environ.- 21st Cent. vII pp 251-254.