

Water Quantity Interpretations

Soil Rating for Nitrate and Soluble Nutrients

This section provides a way to determine the degree to which water percolates below the root zone in certain soils. Percolating water containing dissolved nitrates or other soluble nutrients could be a hazard to ground water. The method is based on a Leaching Index (LI).

For areas with ground water concerns, the LI should be determined to evaluate the potential for contaminating the ground water with soluble nutrients. The LI uses annual precipitation, hydrologic soil group, and rainfall distribution data.

Leaching Index

An LI map for each hydrologic soil group was developed for Missouri. The hydrologic group describes those soils that do not have dual hydrologic ratings because of differences in drainage. If the soil has a high LI and is over a shallow aquifer, soluble nutrients (especially nitrates) may contaminate the water. Refer to FOTG Section I-(iii) for the Leaching Index Map for each hydrologic soil group or to the following charts for county specific leaching information.

The LI does not account for irrigation. If irrigation is applied only to supply crop needs, there will be little additional loss below the root zone. The additional loss would be relative to the precipitation events after the soil profile is saturated or nearly saturated due to irrigation applications.

In areas of marginal water quality, the amount of irrigation water applied includes a leaching fraction to insure that salts do not accumulate in the soil. If a leaching fraction is applied, this amount of water must be added to the LI.

Procedure

Follow these steps to determine the leaching index of a certain soil:

- 1) Determine the hydrologic soil group for the dominant soil in the field. Refer to the published soil survey or Section II of the Field Office Technical Guide.
- 2) Locate the Leaching Index Map [FOTG Section I-(iii)] by the hydrologic soil group of the dominant soil in the field or refer to the chart below.

- 3) From the map or the following chart, determine the Leaching Index rating for the appropriate hydrologic soil group by county.

Leaching Index in Inches through the Root Zone

	Missouri County	Hydrologic Soil Group			
		A	B	C	D
1.	Adair	10	6	4	2
2.	Andrew	10	6	4	2
3.	Atchison	10	6	4	2
4.	Audrain	15	8	6	4
5.	Barry	15	10	6	4
6.	Barton	15	10	6	4
7.	Bates	15	8	6	4
8.	Benton	15	10	6	4
9.	Bollinger	20	15	8	6
10.	Boone	15	8	6	4
11.	Buchanan	10	6	4	2
12.	Butler	20	15	10	6
13.	Caldwell	10	6	4	2
14.	Callaway	15	8	6	4
15.	Camden	15	10	6	4
16.	Cape Girardeau	20	15	8	6
17.	Carroll	10	8	4	2
18.	Carter	20	15	8	6
19.	Cass	15	8	6	4
20.	Cedar	15	10	6	4
21.	Chariton	10	8	4	2
22.	Christian	15	10	6	4
23.	Clark	10	6	4	2
24.	Clay	10	8	4	2
25.	Clinton	10	8	4	2
26.	Cole	15	8	6	4
27.	Cooper	15	8	6	4
28.	Crawford	15	10	6	4
29.	Dade	15	10	6	4
30.	Dallas	15	10	6	4
31.	Daviess	10	6	4	2
32.	DeKalb	10	6	4	2
33.	Dent	15	10	8	4
34.	Douglas	15	10	8	4
35.	Dunklin	20	15	10	8

	Missouri County	Hydrologic Soil Group			
		A	B	C	D
36.	Franklin	15	8	6	4
37.	Gasconade	15	8	6	4
38.	Gentry	10	6	4	2
39.	Greene	15	10	6	4
40.	Grundy	10	6	4	2
41.	Harrison	10	6	4	2
42.	Henry	15	10	6	4
43.	Hickory	15	10	6	4
44.	Holt	10	6	4	2
45.	Howard	15	8	6	4
46.	Howell	20	10	8	6
47.	Iron	20	10	8	4
48.	Jackson	15	8	6	4
49.	Jasper	15	10	6	4
50.	Jefferson	15	10	6	4
51.	Johnson	15	8	6	4
52.	Knox	10	6	4	2
53.	Laclede	15	10	6	4
54.	Lafayette	15	8	6	4
55.	Lawrence	15	10	6	4
56.	Lewis	10	6	4	2
57.	Lincoln	15	8	4	2
58.	Linn	10	8	4	2
59.	Livingston	10	6	4	2
60.	McDonald	15	10	6	4
61.	Macon	10	8	4	2
62.	Madison	20	10	8	6
63.	Maries	15	10	6	4
64.	Marion	10	8	4	2
65.	Mercer	10	6	4	2
66.	Miller	15	10	6	4
67.	Mississippi	20	15	10	8
68.	Moniteau	15	8	6	4
69.	Monroe	15	8	4	2
70.	Montgomery	15	8	4	2
71.	Morgan	15	10	6	4
72.	New Madrid	20	15	10	8
73.	Newton	15	10	6	4
74.	Nodaway	10	6	4	2
75.	Oregon	20	10	8	6
76.	Osage	15	10	6	4
77.	Ozark	15	10	8	4
78.	Pemiscot	20	15	10	8
79.	Perry	20	10	8	6

	Missouri County	Hydrologic Soil Group			
		A	B	C	D
80.	Pettis	15	10	6	4
81.	Phelps	15	10	6	4
82.	Pike	15	8	4	2
83.	Platte	10	8	4	2
84.	Polk	15	10	6	4
85.	Pulaski	15	10	6	4
86.	Putnam	10	6	4	2
87.	Ralls	15	8	6	4
88.	Randolph	10	8	4	2
89.	Ray	10	8	4	2
90.	Reynolds	20	10	8	6
91.	Ripley	20	15	10	6
92.	St. Charles	15	8	6	4
93.	St. Clair	15	10	6	4
94.	Ste. Genevieve	15	10	8	4
95.	St. Francois	15	10	8	4
96.	St. Louis	15	8	6	4
97.	Saline	15	8	6	4
98.	Schuyler	10	6	4	2
99.	Scotland	10	6	4	2
100.	Scott	20	15	10	8
101.	Shannon	20	10	8	6
102.	Shelby	10	8	4	2
103.	Stoddard	20	15	10	8
104.	Stone	15	10	6	4
105.	Sullivan	10	8	4	2
106.	Taney	15	10	6	4
107.	Texas	15	10	8	6
108.	Vernon	15	10	6	4
109.	Warren	15	8	6	4
110.	Washington	15	10	6	4
111.	Wayne	20	15	10	6
112.	Webster	15	10	6	4
113.	Worth	10	6	4	2
114.	Wright	15	10	6	4

Guidelines for Recommendations

Leaching Index rating:

- a) Soils with an index rating of 2 to 4 have a low potential to leach nutrients below the root zone.

- b) Soils with an index rating of 5 to 10 have a medium potential to leach mobile nutrients below the root zone. Consider site specific land treatments to minimize the potential for leaching losses.
- c) Soils with an index rating exceeding 10 have a high potential to leach nutrients below the root zone. Special consideration for the method, rate, and timing of nutrient applications should be implemented to reduce the potential of losses to groundwater resources.