

Assessing Nitrate Leaching Potential by Hazard Index

Laosheng Wu, John Letey and Christine French, Center for Water Resources, University of California, Riverside, CA 92501

Some of the highest levels of nitrate were found in streams and ground-waters in agricultural areas. An internet-based, interactive hazard index (HI) was developed to assess the relative vulnerability of groundwater to agricultural nitrate contamination in irrigated crop fields. The HI uses factors of soil type, crop, and irrigation system, each with their own hazard rating, to assess the vulnerability, or potential hazard, of a site. Soils are rated on a scale of 1 to 5 while crops and irrigation are each rated from 1 to 4; in each case the relative hazard potential is lowest at 1. By multiplying the values from each factor, the specific site HI can range from 1 to 80 (Table 1). The greatest attention and resource investment can then be directed to areas with a high HI rating, while less concern is given to areas with a low rating. The HI contains a database of over 500 soils and 150 crops in the three southwest states of Arizona, California, and Nevada, with each soil type and crop ranked for their leaching potential. An online soil survey browser was also added to help the users to find their soil series from the maps.

Table 1. Matrix for the overall hazard indices that overlay soil, crop and irrigation.

Crop	Soil					Irrigation
	1	2	3	4	5	
1	1	2	3	4	5	1
1	2	4	6	8	10	2
1	3	6	9	12	15	3
1	4	8	12	16	20	4
2	2	4	6	8	10	1
2	4	8	12	16	20	2
2	6	12	18	24	30	3
2	8	16	24	32	40	4
3	3	6	9	12	15	1
3	6	12	18	24	30	2
3	9	18	27	36	45	3
3	12	24	36	48	60	4
4	4	8	12	16	20	1
4	8	16	24	32	40	2
4	12	24	36	48	60	3
4	16	32	48	64	80	4