

Crop Removal of Chloride

By P.E. Fixen

IT IS OFTEN useful to farmers and their advisors to be able to estimate the amount of chloride (Cl) removed in harvested crops. Crop removal and leaching below the root zone are the only significant losses of Cl from cropping systems.

Table 1 below indicates that very little Cl is removed in grain. For example, a 60 bu/A wheat crop removes less than 2 lb of Cl in the grain. Harvest of grain and straw (assuming the straw hasn't been rained on extensively) could remove 10 to 30 lb/A, depending on soil level and the level of Cl applied.

Plant material with a high water content at harvest usually contains substantial amounts of Cl. A 6 ton/A alfalfa crop would remove approximately 45 lb of Cl using the levels in the table. Soil or applied Cl levels can markedly alter Cl removal in forage crops. Plant analysis is the only means of accurately determining removal.

The removal values in **Table 1** are based on limited data and should be viewed as rough estimates only. For further information on the subject, a review of the references listed below is suggested. ■

Table 1. Chloride removal by selected crops.

Crop	Plant part	Cl content	Reference
Alfalfa	Shoot	7.6 lb/ton (dry wt)	NRC, 1981
Barley	Grain	0.024 lb/bu ¹	Fixen, 1993
Potatoes	Tubers	0.06 lb/cwt	Saffigna et al., 1977
Sweet clover	Shoot	7.4 lb/ton (dry wt)	NRC, 1981
Wheat	Grain	0.026 lb/bu	Fixen, 1993
Wheat	Grain + straw		Schumacher, 1988
	Low soil Cl	0.17 lb/bu	
	High soil Cl	0.44 lb/bu	

¹Calculated using same concentration as wheat.

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soil disturbance during establishment. Soil disturbance stimulates organic matter degradation and N mineralization.

After sod establishment, percolate NO₃-N concentrations decreased to levels well below drinking water standards, indicating that N fertilizers applied to mature, undisturbed turf are generally no threat to groundwater quality.

Highest percolate NO₃-N concentrations in late summer and early autumn are probably due to diminished root ini-

tiation and elongation and less plant uptake of N during this time of year. Seasonal variation in climate is likely to have more effect on nitrate leaching than fertilization treatments.

Although establishment method, fertilization program and N source treatment effects were significantly different, percolate NO₃-N concentrations from established turf were well below the current drinking water standard of 10 ppm NO₃-N. ■