Whiffing Sulfur Levels of Tidal Marsh Soils

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It has been well documented that the sulfur content of tidal marsh soils is significant to their management, classification and genesis; but how significant is the smell? What can this tell us about the soil sulfur status? Often in traversing or sampling tidal marsh soils in Maryland during the course of a reconnaissance soil survey (Darmody, 1975) the odor of sulfur was detectable at varying degrees of intensity. If the intensity of the odor was correlated with total sulfur content, a soil surveyor could do a better and more rapid job of mapping tidal marsh soils. To check this possibility the \( \text{H}_2\text{S} \) (hydrogen sulfide) aroma of tidal marsh soil samples was ranked on a 0 to 3 scale. A sample was given an “0” rank when no odor could be detected. A ranking of “1” indicated that the odor was detectable only if the soil was held close to the nose (Fig. 1). When \( \text{H}_2\text{S} \) odor was noticed as soon as the sampling process began, the ranking was “2”. In marshes where the presence of \( \text{H}_2\text{S} \) was noted when simply walking across the marsh, the ranking was “3”. Half values were used in intermediate situations. This “whiff test” for sulfur was later shown to be significantly correlated with total sulfur content of the marsh surface soil as determined by X-ray fluorescence (Fig. 2) (Darmody et al., 1977).

All Maryland tidal marsh soils that give a whiff value of 1 or more were shown to have sufficient sulfur to qualify as sulfidic materials (Darmody et al., 1977; Soil Survey Staff, 1975). A few marsh soils with whiff of less than 1 were also sulfidic. Attempts to apply the nose to upland sulfidic materials, such as those exposed in surface mining for coal, indicate that the whiff test in its present form is not reliable. Apparently the \( \text{H}_2\text{S} \) aroma from well-crystallized pyrite is essentially nil.

REFERENCES


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