Many satisfactory methods exist for determining the S content of plant and soil samples. Contradictory reports exist concerning the accuracy, precision, and reliability of almost every method. The ability or inability to use a particular method may rest with the analyst, equipment, method, or nature of the sample. Methods tend to be developed to fit the analytical situation and have characteristics which make them preferable in terms of accuracy, reliability, or speed. The purpose of this paper is to point out some useful methods for measuring S contents of plants and soils and to comment on their accuracy, reliability, and conditions necessary for their successful utilization.

There are many forms of S in plants and soils. It is questionable whether for many purposes information on all the forms present would be any more useful than groupings of compounds having similar chemical properties. Due to the difficulty of measuring all the S compounds present in either plant or soil it has become common practice to describe the S components using broad groupings. These groupings include such descriptions as: total, organic, inorganic, pyritic, protein, HI reducible, Raney Ni reducible, HCl soluble, and other such designations.

Analytical techniques for the determination of total S or any of the various forms of S must take into account the nature of all S compounds present in the sample. This would include sampling, drying, grinding, oxidation or reduction, and detection of the S. Sulfur compounds shown in Table 17-1 are grouped according to valence and whether or not they are inorganic or organic. The chemistry and occurrence of these compounds in soils and in organic substances is discussed by Anderson (1975), Freney (1967), Williams (1975), and Stevenson (1982). However, most of the information is in terms of extractants, combinations of extractants, and reducing agents rather than specific compounds or groups of compounds.

Methods to determine discrete S compounds or to measure those