Crude Protein of Corn Grain and Stover as Influenced by Different Hybrids, Plant Populations, and Nitrogen Levels

M. S. Zuber, G. E. Smith and C. W. Gehrke

CORN, with average protein content, contains about three-fourths of a pound of nitrogen per bushel. An additional one-half pound is normally required by the vegetative portion to produce this amount of grain. A yield of 100 bushels will require a minimum of 120 pounds of this element. Few soils can deliver this quantity in a single season, and in many areas nitrogen is the limiting element in corn production.

During the past 5 years the application of synthetic nitrogen fertilizers to corn has greatly increased (nearly eight-fold in Missouri). Rates of application in excess of 100 pounds of nitrogen per acre have produced significant and profitable increases in yield and are becoming a regular practice in many areas. There has been much interest in the effect of these liberal applications on the composition of grain.

This study reports the effects of variety, plant populations, and nitrogen fertilization on the crude protein content of corn grain and stover in two seasons.

REVIEW OF LITERATURE

Morrison (2) in the 11th edition of "Feeding", published in 1911, lists the crude protein content of corn grain as 10.3%. In the 20th edition of 1936, the percentage in No. 2 corn was 9.4%, but in the 21st edition it had dropped to 8.6%. It has been suggested that the loss of nitrogen under intensive cropping, and the development of new hybrids, with higher yielding potentials, are responsible for this decline.

Schneider et al., (3) studied corn from 30 states and found an average of 8.7% crude protein in 1946 and 9.1% in 1947.

Smith (4) reported the effect of long-time soil treatments and cropping systems on crude protein content of corn grain. Earley and DeTurk (1) found that an increase in rate of planting decreased the percentage of protein. The application of additional nitrogen increased protein production. Small applications of nitrogen increased yields with little effect on protein content. Additional...