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SULFUR

critical for maximum production of

SUBTERRANEAN CLOVER FORAGE



Stand of subclover and annual grasses fertilized with gypsum, left, as compared with check plot to right at Hopland Field Station.

STUDIES ON the sulfur requirements of subclover, *Trifolium subterranean* L., were initiated because of the importance of this species in the coastal counties of California where sulfur deficiencies in the soils are widespread. It has been discovered, for example, that many yield

increases formerly attributed to phosphorus were actually due to the sulfur content of the phosphate carrier.

The critical concentration of a sulfate sulfur in the tissue of subclover was determined to be about 170 ppm according to these studies. Critical concentration is

defined as that nutrient concentration which is just deficient for maximum growth.

The studies were conducted both in the greenhouse and in the field. At one location in the field it was found that the addition of phosphorus alone had no effect upon plant growth. However, as the graph indicates, even the 3% sulfur content of treble superphosphate, which contributed only 6 pounds of sulfur per acre, increased yields from 3,400 pounds per acre to about 4,500 pounds per acre. Yields increased to 7,600 pounds of forage per acre as the rate of sulfur application was increased to 12 pounds per acre. Additional amounts of sulfur did not increase forage yields. The concentration of sulfate sulfur in flowering subclover increased very little where yields increased with increasing rates of sulfur. But when the critical concentration was reached, the sulfate sulfur concentration increased rapidly, while yields increased very little.

In the greenhouse, subclover plants were harvested at the first, third and fifth flower growth stages, and the plant material was divided into leaves, petioles and stems. The sulfate sulfur concentration did not change significantly over these three stages of growth. The relation of clover yield to sulfate sulfur concentration indicated that at the critical sulfate value, the sulfate sulfur concentration

Relation of total forage production to the sulfate sulfur content of subterranean clover plants receiving increasing amounts of sulfur on a sulfur deficient soil.



