INTRODUCTION

Until about 1960, an alfalfa yield of 4 to 5 tons per acre was considered very good. Now, yields of 8 to 10 tons per acre and higher have been obtained in the Corn Belt. Dow (28) reported that many farmers in central Washington are producing 8 to 9 tons per acre and a few growers are obtaining 10 tons per acre. In southern California, where the growing season is much longer, yields as high as 16.2 tons per acre have been reported (3).

Increased use of fertilizer, along with improved varieties, herbicides, insecticides, proper cutting management, and, in some areas, irrigation have been responsible for the increased yields. Liberal fertilization usually results in quicker regrowth, which makes more frequent cutting possible. The production of high-yielding alfalfa removes much larger amounts of plant nutrients than grain such as corn or wheat. This is particularly true of N, K, and Ca, which are removed in largest amounts.

Generally, where these high yields are being obtained, alfalfa is harvested at a more immature stage. This increases removal of a number of plant nutrients because the concentration of many elements is higher in young plants. Thus, the larger yields and higher concentration of nutrients of the alfalfa plants have greatly increased nutrient removal. Recognition of this phenomenon and more liberal application of fertilizer have resulted in greatly increased yields of alfalfa.

Unfortunately, most experiments on alfalfa fertilization were conducted at yield levels that are low by present-day standards. These results appear to be of questionable value and possibly misleading when making fertilizer recommendation for present-day alfalfa growers.

FACTORS AFFECTING NUTRIENT NEEDS

A number of factors must be taken into consideration when determining the amount of fertilizer that should be applied. Alfalfa starts growth in