DEPOSITION AND UTILIZATION OF RESERVE FOODS IN ALFALFA PLANTS

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INTRODUCTION

That mineral nutrients and organic compounds accumulate in plants and are utilized for future growth has long been recognized, but a knowledge of how such storage and utilization are influenced by various agricultural practices and the relation of these to the problems of plant production is but now coming to be more fully appreciated.

Recent work on horticultural plants has demonstrated that their growth and fruit production are directly related to the kinds and quantities of organic foods manufactured by and stored within themselves. Many orchard practices are now based on plant compositions, as well as soil nutrient materials available, or made available, through cultural methods. That a similar relationship concerning storage and utilization of organic foods obtains in some herbaceous plants, especially perennials, is beyond doubt. Just what the relationships are for specific plants still remains to be determined, but progress in this study is being made.

Cutting trials on alfalfa over a period of years at the Kansas and Wisconsin Experiment Stations have shown that yields are progressively decreased, stands deteriorated, and root growth of the plants retarded with early and frequent cuttings. At the Wisconsin Experiment Station the physiological responses of the plants and the chemical composition of the roots have substantiated the hypothesis that new top growth, especially after the cutting of a crop, is initiated in a large measure at the expense of the previously deposited root reserves; and, unless such reserves could be partially or wholly replenished between periods of cutting the tops, it would follow that such reserves would become severely reduced, tending to diminish progressively the amount of new growth following each...