The stored organic foods of certain plants have been recognized to have an influence on their productivity. The significance of these reserves in practical agriculture has not become fully appreciated. Physiological manifestations indicate an important inter-relationship between the size and composition of the corm of timothy or the root of alfalfa and the productivity of their top growths.

Waters of the Missouri agricultural experiment station was the first to recognize the importance of maturity of tops and corm storage in relation to the yield and permanence of timothy. He states: "Early cutting thins the stand, this thinning can be avoided by allowing the plants to mature. Allow the plants to mature and they will have large well filled and well matured bulbs. The period of greatest development of these bulbs and the most rapid storage of plant food in them is between the time when the plants are just headed and when they are fully ripe. The bulbs are exhausted to an unusual degree by having to support two growths without the opportunity of fully repairing the loss thus sustained."

This idea can be extended to other crops. In alfalfa, the root (possibly the crown also) is an important depository for root reserves.

Physiological responses of alfalfa, as demonstrated by the investigations set forth in this paper, substantiate the hypothesis that new top growths, especially in their early stages, are initiated largely at the expense of previously-deposited organic root reserves. The quality of these storage materials and their relative availability to the early growth requirements of a young shoot influence its subsequent growth and ultimate production. The translocation of the...