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## Structure of the Libriform Fibers in the Roots and Crowns of Alfalfa and Sweet Clover

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origin, in most cases forming a continuous sheath enclosing all tissues inward from the phloem.

Some interesting results were obtained last summer by burying rammie stalks in swamp mud under about four inches of water. Insufficient work was conducted to yield any definite data.

DEPARTMENT OF BOTANY,  
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STRUCTURE OF THE LIBRIFORM FIBERS IN THE  
ROOTS AND CROWNS OF ALFALFA AND  
SWEET CLOVER

JOHN N. MARTIN

In addition to the middle lamella there are two layers, primary and secondary, in the walls of the libriform fibers. The primary layer is composed of strands of fibrils helically oriented around the fiber almost at a right angle to the fiber axis. The secondary layer is composed of a number of lamellae each of which is composed of fibrils that run parallel to the axis of the fiber.

The primary and secondary layers are cellulose. In sweet clover the secondary layer of the libriform fibers is removed and apparently used as food. The primary layer is then thickened and lignified. In alfalfa the secondary layer of the libriform fibers near the cambium are removed during spring growth and then replaced in the summer.

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THE GERMINATION OF SWEET CLOVER AND  
ALFALFA SEED IN RELATION TO VARIOUS  
CONDITIONS OF TEMPERATURE AND  
MOISTURE

JOHN N. MARTIN

Seeds have been stored in constant low temperatures, constant room temperatures, and in fluctuating temperatures, both in dry and wet, and alternating dry and wet conditions. The experiments