PLASMA MEMBRANE CHANGES IN AVOCADO POSTHARVEST PHYSIOLOGY

Eugene A. Nothnagel

Research on this project is being performed principally with the assistance of Thomas F. Dallman (graduate student) and with the collaboration of Professors William W. Thomson of the Department of Botany and Plant Sciences and Irving L. Eaks of the Department of Biochemistry. The goal of the project is to understand how membranes of avocado fruit cells participate in the physiological processes of fruit ripening. Particular emphasis is being placed on the plasma membrane which adjoins the cell wall and acts as a barrier and gateway for the delivery of polysaccharide-degrading enzymes to the cell wall during fruit softening. An understanding of membrane changes during ripening may eventually help to provide a basis for planning a rational strategy for the control of avocado ripening.

In previous work on this project, we have shown that the buoyant densities (relative weights) of membranes from fruits increase during ripening. Our recent results indicate that a relative decrease in the glycolipid content correlates with the increase in density of the plasma membrane fraction. Membrane protein analysis by electrophoresis indicates that several plasma membrane proteins change in relative abundance during ripening. These changes include relative increases in bands of proteins of molecular weight 36,000 and 50,000 as well as a relative decrease in a band at molecular weight 26,000. Recent resumes obtained with anti-cellulase antibody indicate that part of the increase in the 50,000 molcular weight band is due to cellulase associated with the plasma membrane fraction. We are now working towards production of antibodies against some of these proteins that change in abundance during ripening. Our initial experiments with antibody production in chickens is now underway with the cooperation of Don Bell of Cooperative Extension.