Introduction to the Workshop

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In the last decade, engineers have made significant strides for machine-harvesting fruits and vegetables. For example, sweet cherry (*Prunus avium*) can be machine harvested for the fresh market with an improved mechanical harvester. Other sweeping changes are needed if fresh market fruit and vegetable industries are to remain competitive. Fruit and vegetable commodity groups are increasing their investments in marketing to try to maintain their market share in the highly competitive global marketplace. Also, growers have invested in new and improved production systems that will provide more efficient cropping systems for growing fruits and vegetables. There are examples of past attempts to integrate harvest mechanization into fruit and vegetable production systems, but many of these have failed because of mechanical problems or they were not cost effective. At the present only a few universities and federal laboratories have an active research program with the aim of developing mechanical harvester-based production systems that reduce field losses and fruit damage, improve recovery, and decrease the foreign materials in the harvested products. Efforts in harvest mechanization must be maintained because growers are facing increasing pressure to reduce production cost, and the continued availability of a skilled workforce to harvest fresh fruits and vegetables is a major concern.

In this workshop, the four invited speakers from the American Society of Agricultural Engineers will describe their recent research and development efforts in robotics, computer vision, neural networks, and in shake-and-catch technology. It is hoped that these presentations will give engineers and horticulturists a renewed synergism to think about plant architecture for improved productivity and efficient and rapid harvest technologies for highly perishable fruits and vegetables. It is intended to foster discussions between crop production specialists and engineers because we must work together to develop an integrated approach to increase labor productivity and reduce unit-harvesting cost. If we are to develop alternatives to hand harvest production, we must first develop systems design and approaches to integrate crop characteristics and architecture, planting configuration, cultivation of plants, and machine-based harvesting technology.