

Hydro-Cooling

What is Hydro-cooling? Hydro-cooling is the process or technique of arresting the ripening of fruits and vegetables after harvesting by immersion in ice or cold water.



Here at the Southwest VA Farmers Market, courtesy of a USDA grant, we were able to purchase the items needed to build two hydro-coolers for precooling of our producers fruits & vegetables from the field.

Fruits and vegetables begin to deteriorate after they are harvested and separated from their growing environment. The rate of deterioration defines how long they will be acceptable for consumption. This is known as “shelf life”. To preserve the quality of fruits and vegetables and maximize profits for growers, it is critical to control the temperature of fresh produce and minimize the amount of time that products are exposed to detrimental temperatures.



Both temperature and relative humidity are important during the post harvest handling of fruits and vegetables. Heat, in particular, decreases produce quality and reduces market shelf life. Heat damage can come from two interrelated

sources: the field’s temperature at harvest and the produce’s natural respiration. High field temperatures raise product temperatures; therefore, it is important to cool produce as rapidly as possible to avoid tissue damage. Some products that

are sensitive to temperature abuse and experience excessive weight loss when field temperatures are too high. Some growers harvest their products at night to avoid excessive daytime heat. The second source of heat comes from natural respiration. Fruits and vegetables are still alive after they are harvested and they react with oxygen to form carbon dioxide, water and heat.



Although this “heat of respiration” varies with different fruits and vegetables, in general as product temperature increases, respiration and heat generation also increase, shortening the shelf life.

Hydro-cooling is one of the fastest precooling methods. Fruits and vegetables can be cooled rapidly by bringing them in contact with cold moving water. One main advantage of hydro-cooling is that it does not remove water from the produce and may even revive slightly wilted produce.



For efficient hydro-cooling, water should come in contact with as much of the surface of each fruit or vegetable as possible. Water also must be kept as cold as possible without endangering produce. In commercial practices, water temperature is usually kept around 31°F except for chilling sensitive commodities.

Produce in bulk or in containers is carried on a conveyor through a shower of water. To avoid “channeling” (water pouring through larger openings where there is less resistance), it is necessary to either use a heavy shower over a shallow depth of produce or proportion the shower and the drainage from the bottom of containers so that the containers fill partly or entirely with water. Drainage must be sufficient to keep the water in the containers moving and to remove all water before containers leave the hydro cooler



Although there are some food safety concerns related to hydro cooling, properly using active chlorine or ozone to disinfect the water used in the process can reduce the potential risk of spreading any contamination. The Market abides by all Food Safety Rules when hydro cooling the producers' product.