

Abstract

Recent studies have provided evidence that lysophospholipids such as lysophosphatidylethanolamine (LPE) can accelerate fruit ripening and prolong shelf life of fruits, vegetables and cut flowers. LPE is a natural phospholipid rich in egg yolk and soy lecithin. The present study was undertaken to investigate some of the physiological and biochemical aspects of the mechanism of action of LPE. Studies were undertaken on the cranberries and tomatoes with an idea to gain information on the value of LPE for production horticulture.

A preharvest spray application of LPE increased anthocyanin production in cranberry fruits and prolonged shelf life of these fruits. LPE derived from either soybean or egg lecithin was effective in accelerating anthocyanin production and prolonging shelf life of cranberry fruits. In contrast to tomato and banana, a ripened cranberry fruit was found to have longer shelf life than mature white or blush fruit. Reduced respiration rate of dark red fruits may explain their longer postharvest life. Furthermore, a ripened cranberry fruit has thicker cuticle and higher cuticular strength than unripe fruit. Thus, a ripened fruit may be better protected from mechanical injury by machine harvest, and the calyx end of the fruit may be better protected from entry of microorganisms during wet harvest.

LPE applications reduced damage to tomato leaves caused by ethephon. LPE application mitigated ethephon injury but maintained fruit ripening. Applications of LPE either prior to ethephon or mixed together with ethephon were effective in mitigating ethephon injury to the leaves. These results suggest that LPE either alone or mixed with ethephon, can be used as a ripening enhancer of tomatoes. A preharvest application of LPE was found to modulate phospholipase D *in vivo*. This modulation may help explain the protection by LPE from ethylene promoted senescence. LPE has the potential to mitigate phytotoxic effects of chlorothalonil (Bravo) on cranberries. LPE mixed with Bravo resulted in improved fruit set, higher fruit yield and larger fruit as compared to Bravo alone.