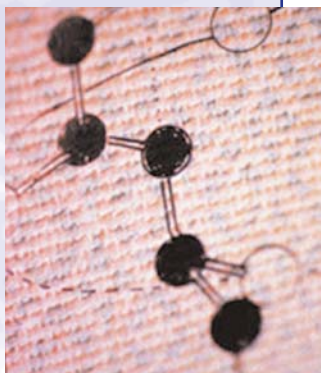


PROTECTED TECHNOLOGY

Nutra-Park's technology is patent protected. Initial patents were secured with cooperation from the Wisconsin Alumni Research Foundation (WARF). Nutra-Park also continues to patent new uses of LPE and related compounds for a wide variety of commodities and applications.

LPE technology is federally registered. Nutra-Park received Environmental Protection Agency (EPA) registration in March of 2002 and state approval for 48 states. Nutra-Park continues to conduct field efficacy trials under Experimental Use Permits issued by the EPA to confirm findings for new applications currently in development. This research consistently confirms that LPE technology works with a broad range of crops in both pre-and post-harvest applications.



NUTRA  PARK™

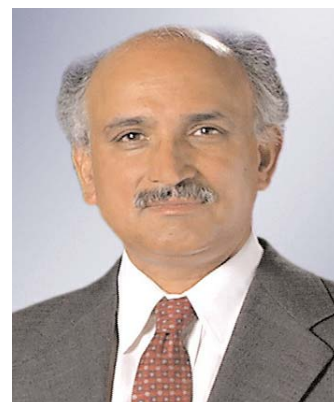
The Science Behind LPE

Lysophosphatidylethanolamine or LPE is a naturally occurring biomolecule derived from naturally abundant sources such as egg yolks and soybeans.

LPE and other phospholipids are integral elements in the cell membranes of living organisms—everything from plants to animals to humans. They play a critical role in the biological life cycle, and our research shows that some phospholipids, such as LPE, affect the natural process of growth, maturation and decay.

Discovery

Dr. Jiwan Palta of the University of Wisconsin and an original founder of Nutra-Park, was conducting research with the goal of reducing the impact of early frost on Wisconsin's cranberry crop. Dr. Palta was focused on improving the frost hardiness of the cranberry fruit and plant; while also starting to investigate the means to accelerate fruit ripening with ethephon to allow for earlier harvest.



During his early work, Dr. Palta established that the cranberry fruit has a very thick and waxy cuticle that was not permeable to ethephon. (Palta and Stang, 1983, Farag and Palta, 1987, Farag et al, 1985). However, ethanol, ursolic acid or natural lipids such as LPE could be used to increase the penetration of ethephon and the ripening of cranberry fruit could be accelerated (Farag et al, 1989).

In field trials of the new, improved ethephon formulations, Dr. Palta and his student Karim Farag, made an unexpected and an almost unbelievable discovery: when applied alone to cranberries, a naturally-occurring phospholipid (LPE) could actually enable ripening.

How is it possible for a molecule to both ripen and slow the rate of decay?

LPE acts as an intelligent signaling molecule to stimulate uniform ripening in fruits and vegetables. It also has the ability to slow senescence, allowing fruits, vegetables and cut flowers to stay fresher and last longer. The key benefit is added value through increased quality of fruits, vegetables and cut flowers.

Conventional wisdom states that fruit ripens in response to an increase in ethylene production resulting in an increase in respiration. These responses accelerate

ripening but result in poor shelf life. This means that as fruits such as tomatoes and bananas ripen, they soften, reducing quality and sellability. Thus scientists have considered ripening an aging process.

During Dr. Palta's work with cranberries, he discovered that cranberries do not have the same response to ripening as tomatoes and bananas. In fact, careful study proved that fully ripened (red) cranberry fruits store better than less or un-ripened (blush, white) fruits (Ozgen and Palta, 2001).

Cranberries were sorted by color and stored. Five weeks after cold storage, 80% of the red fruit was marketable where as only 40% of the white fruit was marketable. White fruit also had a higher respiration rate than red.

This study concluded that as cranberry fruit ripens, its shelf life is improved, just as the LPE technology shows. LPE technology enables the fruit ripening process, yet improves the shelf life just like the cranberry fruit has learned to do in nature.

LPE technology teaches us that ripening is not necessarily aging. When fruit is physiologically mature, but not ripe, LPE promotes ripening by stimulating the ethylene pathway to enable ripening but does not increase respiration, like other ripening agents. When fruit is already ripe, LPE inhibits the production of an enzyme called phospholipase D. (Ryu et al, 1997). This enzyme is known to break down cell membranes and cause aging.

This dual activity; the ability to enable ripening while regulating the cell membrane aging process, is unique to LPE and the family of phospholipid molecules.

Quality Enhancement, Naturally

The benefits of this technology can be seen in a wide range of commodities:

- In grapes, LPE increases marketable grapes at first harvest and improves grape quality and shelf life without harming vines and enables the natural ripening process.
- In cut flowers, LPE slows the aging process, allowing flowers to stay fresher longer. LPE also maintains cell wall integrity that results in more vibrant blooms.
- For cranberries, LPE promotes higher marketable yield with uniform color development.
- In tree fruit, LPE improves fruit quality and promotes more uniform color development.
- For tomatoes, LPE can improve fruit quality and accelerate the natural ripening process.
- And for many other vegetables and fruits, LPE helps in extending shelf life, improving the overall quality and enabling the ripening process.

There are no known side effects associated with LPE. That's because the main ingredient is a natural element found in all living organisms: a benefit in both application and at harvest for applicators and produce handlers.

More Uses to Come

LPE and the family of phospholipid molecules are being tested in both laboratory and field trials on a wide range of commodities. Discovery of new and unique ways to use LPE are being made to help provide a more abundant harvest of higher quality crops and produce.

For More Information

More information on current uses of LPE and additional background on Nutra-Park can be found at our website: www.NutraPark.com.

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