

Nanotechnology makes mango farming more profitable in Krishnagiri

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Krishnagiri (Tamil Nadu): It was a typical mango season a year ago for Varadarajan, a plantation-owner in Krishnagiri, the “mango district of Tamil Nadu”. Varadarajan was doing his best to get a good harvest yet there were certain problems that looked so inherent to mango that he never expected a solution. As the mango season arrived, he lost some of the mangoes before they turned ripe. “They would simply drop off for no good reason,” he says. At the same time, he could not think of sending his mangoes far due to the low shelf life of the fruit.

The loss of fruit due to various factors is as high as 20 to 50 per cent in the world, while in Asia it is around 30 per cent, says Prof. K.S. Subramanian from the Tamil Nadu Agricultural University (TNAU), Coimbatore in India, who is at the forefront of research on use of nanotechnology in keeping fruit fresh.

While these factors affected profitability, another issue is that the mango season is short. “When mangoes ripen, there are heaps of mangoes in the market, creating such an abundance and oversupply that one cannot get a good price. And then all of a sudden they are gone. If there was a way one could sell mangoes late in the season, one would earn a much better profit,” says Varadarajan. As a result, his mangoes got him modest prices in the peak season.

One evening, at a farmers’ meeting in the nearby town, Varadarajan heard about the experience of his farmer-friend, Santa Kumar. Kumar told a gathering of farmers that he knew of a natural spray called hexanal that could prolong the shelf life of mangoes. “It was too good to be true, but Santa Kumar had already tried it out and was talking about the results,” says Varadarajan.

Santa Kumar said that he had used a hexanal, treated with nanotechnology, which could delay the ripening of fruit by at least two weeks. All one needed to do was mix it with water in recommended proportions and spray twice on the trees during the season. That prolonged the shelf life of mangoes by more than two weeks. There were other benefits such as fewer mangoes dropping off trees, and of course, the possibility of a longer mango season and sending one’s fruit to far-off markets.

Varadarajan had a few queries which were answered at a team of academics from the Tamil Nadu Agriculture at Coimbatore. He learnt of not only the hexanal-based spray, but other nanotechnology-based products which could keep mangoes fresh and firm much longer than ever before.

Convinced that hexanal was worth a try, Varadarajan asked the team if he could have his plantation covered under the program. Last year, Varadarajan used hexanal on a part of his large farm, leaving out some of his trees as “control” for the sake of comparison. The field partners of TNAU, Myrada, a non-governmental organisation, worked with him to teach him how to mix and spray hexanal. They also introduced him to other methods of fruit preservation such as post-harvest dip, use of nano-technology stickers and films maximise the shelf-life of mangoes.

Varadarajan reaped the results last year and has expanded his business. “I got a season longer by three to four weeks while fruit retention on the trees are improved drastically,” he says. Every tree treated with hexanal is yielding around 5 kilos more than the ‘control’ trees. With techniques such as post-harvest dip (briefly dipping fruit in hexanal and water mix), and use of stickers that release nano-particles in packaging, he found that the fruit, even after being plucked, stay firm and fresh for weeks. Varadarajan also has used nanotechnology to become an exporter of fruit, as these fruits remain firm and fresh after such a long distance. “Not only do I export my fruit, I also buy fruit and export it,” he says. That has made business much more profitable for him. “Earlier I could not dream of sending my fruit far, but now nanotechnology keeps it fresh so I can,” he says. Another farmer, Madhavan, grows three varieties of mango on 11 acres of land. He, too, reports his mangoes stay fresh longer and help him earn a better profit.

Increasingly, farmers in Krishnagiri are getting to learn more about nanotechnology and hexanal and are adopting these with great results. TNAU's community contact initiative with Myryada reaching out to Mango Producers' Groups (MPGs) has helped farmers and their spouses understand the benefits of nanotechnology while the MPGs also serve as points of sale for hexanal-based products which the farmers need.

Prof. Subramanyan hopes in the near future nanotechnology-based products will be produced commercially so that more farmers can benefit. "We are working on getting the permissions to make it possible," he says.