'Get out of my Apple Orchard, otherwise, shoot you with flowers'!

Now flowers may have a greater role than just being cute and sweet!

They can be even deadly weapons to ward off some insect pests in agricultural fields. Yes, it is true though quite metaphorically. Certain species of flowering plants are emerging as bigger players in sustainable pest management and have regularly been included as strips between the crop plants in agroecosystems. It has been happening in many places around the world. Now, Chinese apple farmers are in the news for controlling apple pests with fragrance, I mean with flower strips!

Apple is the major fruit crop of China producing 41.39 million tons. It ranked first in the world in apple production which means a lot for the economy of the country! However, various insects, such as spirea aphids, *Aphis spiraecola*, are major pests in apple orchards.

It often causes devastation and gives sleepless nights to the apple farmers. But how? Its nymphs and adults tend to clump together on the tips of branches and the back of leaves of the apple trees. They suck the phloem sap, cause shoot twisting and leaf rolling, and reduce the overall tree vigor. The aphid can change the size and shape of the apple fruit and cause considerable economic damage by reducing fruit production. Previously, the application of quantities of pesticides in apple orchards has had a serious impact on the environment, but that perhaps affected the pollinators also!

However, enhancing predatory natural enemies in the agricultural ecosystems to biologically control insect pests in apple orchards has been gaining popularity as it can lessen a pesticide overdose. Scientists have come forward and waged war against the insect pests of apples, not with pesticide guns but with flowers. They have attempted to integrate flowering plants in orchards to attract natural enemies for biological control. Promising results are on the way and so are the smiles on farmers' faces! Several orchard studies have demonstrated that the abundance of natural enemies was related to the species and flowering period of the ground cover plants, the initial severity of aphid infestation, the synchronicity between tree growth and flowering

phenology, and so on. The weed strips in apple orchards were observed to shoot up aphidophagous predator abundance and significantly reduce populations of various species of aphid. Interestingly, a complex assemblage of natural enemies reserves more potential for chemical-free pest control than a single species, so diversity is better.

Recent research has moved one step ahead. It demonstrated that in an orchard planting flowering plants with unlike flowering periods increased natural enemy abundance and decreased aphid populations. The underlying rationale perhaps is the flowering plants bloom at different phases of the growth of the apple trees and as a result, the enemies may continuously control spirea aphids during the growth cycle of the trees. Therefore, a temporal mix-and-match of flowering plants may provide sustainable pest control solutions through non-chemical means.

So, we have more jobs to do with flowers now than keeping them in vases or making garlands or gifting them to our sweethearts.

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