Can we count on bees for better fruits every time?

Maybe Yes or maybe Not!
Well, it depends!
That is what unpacked with the kiwifruit in the US.
The kiwifruit, simply kiwi, or Chinese gooseberry is originally a native of central and eastern China but is now cultivated almost globally. Going back to the past says the first recorded description of the kiwifruit was in the 12th century during the Song dynasty of China. Later, in the early 20th century, the cultivation of kiwifruit reached New Zealand - the place of the first commercial plantation. Eventually, the fruit became popular among the British and American servicemen in New Zealand during World War II. Then the fruit began to be exported to Great Britain and California in the 1960s. Over the years, it slowly transformed into a global fruit and cultivated widely beyond its native range..

The most commonly sold kiwifruit is *Actinidia deliciosa* (fuzzy kiwifruit), the other species commonly consumed are *A. chinensis* (golden kiwifruit), *A. coriacea* (Chinese egg gooseberry), *A. arguta* (hardy kiwifruit), *A. kolomikta* (Arctic kiwifruit), *A. melanandra* (purple kiwifruit), etc. Their skin varies in size, hairiness, and color whereas the flesh varies in color, juiciness, texture, and taste. Some fruits are unpalatable, while others taste considerably better than the majority of commercial cultivars. Native kiwifruits are generally much smaller than their commercial cousins. Importantly, insect pollination is more than sufficient for reproduction and successful fruit production for native plants. Primarily bumble bees and less honey bees are considered as the important pollinators of kiwifruit. However, once fruit got bigger through plant breeding, the natural pollination service offered by bees declined, at least in its introduced range, in the US. That is what the latest study comparing various pollinating agents, wind, hand-pollination, and bees, finds out. Now the question is who does the job best? To answer this question, the scientists studied three types of pollinating agents, artificial (hand spread), managed bees, and wind, in pollen transfer and compared the resulting fruit development.

It has been found that managed honey bees (*Apis mellifera*) and bumble bees (*Bombus impatiens*) are frustratingly inefficient in transferring pollen to maintain commercial fruit size. They found that artificial pollination resulted in fruiting in nearly 97% of flowers. It is way ahead of insect pollinators which contributes to just about 3% of flowers

developing fruit. Whereas wind (0.4%) was not even reaching 1%. It is now loud and clear that artificial pollination is by far the superior method for growing commercially viable kiwifruits. It creates quite a costly affair for the common kiwifruit farmers as large fruits sell better. They need to throw a lot of money to pollinate a crop multiple ways, e.g., not only stocking honey bees and bumble bees but also use artificial pollination. You need to pay for to apply the pollen as well. The cost shoots up to thousands of dollars per acre!

Can we blame the bees for not offering efficient pollination service?
Perhaps not! The inadequacy of insect pollination or their inefficiency is probably an unusual situation, created by systematic breeding of trees with large and larger fruit. Is some kind of co-evolution between bumble bees and kiwi pollen operative but broken while bigger fruit development?
No, we do not know yet.

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