explain why field resistance to BT has not been observed so far despite the relatively widespread use of BT. However, for some insects such as pod borer, there is no evidence yet that CryIA(c) and CryIA(b) bind at two different sites on the midgut epithelial cells.

The concern that widespread application of BT in the field might be detrimental to sericulture is ill-founded. BT is a ubiquitous soil microorganism and yet, not a single epizootic in silkworm populations (or, for that matter, in any insect population) has so far been reported. The persistence of applied BT on plants and in soil is limited to a few weeks because the ultraviolet in sunlight effectively inactivates it. Moreover, drift experiments conducted in Japan, a major silk-producing country, showed that silkworms reared on mulberry leaves collected 70 metres away from BT-sprayed plots developed normally. Japan has no restrictions on use of BT formulations, most of which are toxic to silkworm. It should be pointed out here that chemical pesticides that are in use in India are highly toxic to silkworm

BT offers a number of advantages over chemical pesticides: lack of polluting residues, high levels of safety to non-target organisms (including beneficial insects), lower development costs, and a lower likelihood of pest resistance. Additionally, all the necessary technology to deploy BT successfully is available in India. Therefore the use of BT formulations should be undertaken immediately.

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A caveat

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BT must be allowed, but with caution and after carefully controlled trials.

Most of the information here is well documented in several internationally published reviews. It is now well known that BT strains differ in their action spectrum. However, most of the agricultural scientists are not aware of the molecular mechanisms governing this diversity. This article does not supply the details either. I therefore feel that Padidam has passed an opinion without adequate scientific data appropriately summarized.

Secondly, while I concur with the author that BT must be brought to India, the arguments levied are emotional rather than scientific. To date I am of the opinion that, no matter what the arguments are about safety to silkworms, unless trials are conducted in a controlled manner in the neighbourhood of a silkworm colony, either a non-sporulating strain of BT or the extracted toxin material alone has to be used as insecticidal application. Verification is required of the statement that BT is applied extensively in Japan. Perhaps, there, emphasis on sericulture is declining owing to the manpower intensity of the programme, while in India the reverse is true.

Such opinions may be misquoted and misused by firms interested in importing the old-fashioned BT preparations that multinational companies are willing to dump in India.

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Padidam replies:

My intention was to present the fact that BT strains that are safe to silkworm are available and can be used to control insect pests in India. I have stated that there are no restrictions on the use of BT formulations in Japan, and not that BT is applied extensively in Japan. It is the Indian farmer who would gain if an alternative [to chemical pesticides] and safe method of controlling insect pests is permitted.