# Getting the Most Out of Biopesticides in Horticulture: Understanding the Role of UV

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**Abstract.** Biopesticides are increasingly important tools in the management of lepidopterous pests on apple and other crops in New Zealand. They offer superior environmental and human safety through very high selectivity to the target pests, and have no measurable detrimental impacts on non-target organisms. The main two biopesticides in widespread use in certified Organic and Integrated Fruit Production systems are *Bacillus thuringiensis* kurstaki (Btk), which targets a variety of leafrollers and other lepidopteran species, and the codling moth granulosis virus (CMGV). Btk is now the main product in use for leafroller control on kiwifruit, and it is also widely used on grapes, berry fruit, and avocados (Stevens *et al.* 2001). The efficacy of Btk against leafroller larvae on apple foliage is not as good as on other types of foliage, due in part to leaf characteristics (e.g. pH)(Walker *et al.* unpublished results). The persistence of Btk is adversely affected through deactivation from UV (Puzstai *et al*. 1991), and in New Zealand appears to be worst affected in open canopy systems of crops such as apples (Figure 1 and Suckling *et al*. 1993), which are designed to harvest light efficiently. The uptake of Btk by growers interested in reducing broad-spectrum insecticide usage has consequently been hampered by poor performance in insect control. Attempts to deliver improved UV protection have identified the potential to improve Btk performance (unpublished results), but further work is required in this area. This paper examines current information on the role of UV in biopesticide efficacy in horticulture and considers how an increase in UV will impact on biopesticide performance in the future.

## References

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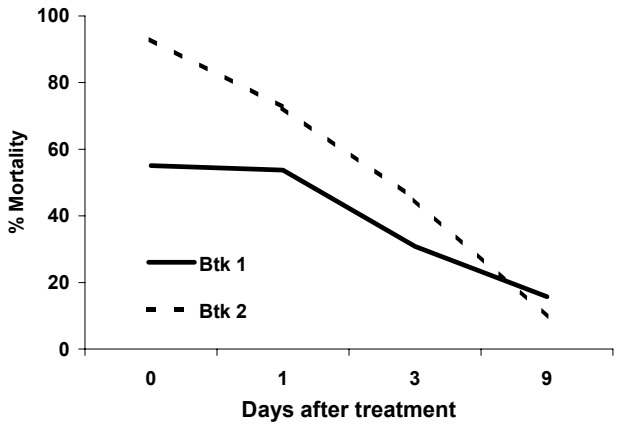


**Figure 1.** Change in mortality of first instar lightbrown apple moth larvae exposed to field aged residues of two Btk formulations applied to potted apple trees, and maintained outdoors until the bioassay.