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Abstract & References

Practical Sampling Plans for *Varroa destructor* (Acari: Varroidae) in *Apis mellifera* (Hymenoptera: Apidae) Colonies and Apiaries

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ABSTRACT

The parasitic mite *Varroa destructor* Anderson & Trueman (Acari: Varroidae) is arguably the most detrimental pest of the European-derived honey bee, *Apis mellifera* L. Unfortunately, beekeepers lack a standardized sampling plan to make informed treatment decisions. Based on data from 31 commercial apiaries, we developed sampling plans for use by beekeepers and researchers to estimate the density of mites in individual colonies or whole apiaries. Beekeepers can estimate a colony's mite density with chosen level of precision by dislodging mites from ≈300 adult bees taken from one brood box frame in the colony, and they can extrapolate to mite density on a colony's adults and pupae combined by doubling the number of mites on adults. For sampling whole apiaries, beekeepers can repeat the process in each of $n = 8$ colonies, regardless of apiary size. Researchers desiring greater precision can estimate mite density in an individual colony by examining three, 300-bee sample units. Extrapolation to density on adults and pupae may require independent estimates of numbers of adults, of pupae, and of their respective mite densities. Researchers can estimate apiary-level mite density by taking one 300-bee sample unit per colony, but should do so from a variable number of colonies, depending on apiary size. These practical sampling plans will allow beekeepers and researchers to quantify mite infestation levels and enhance understanding and management of *V. destructor.*

Keywords: honey bee, parasitic mite, pest management

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