Commodity Quarantine Security: Host Plant Suitability and the Alternative Level of Treatment Efficacy

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The use of probit 9, i.e., 99.9968% mortality or 32 survivors per million treated population, as the acceptable level of quarantine security was recommended over five decades ago, and has since been the practiced dogma. With mortality of the treated population as the criterion, probit 9 provides adequate quarantine security for heavily infested commodity. However, treatment based on probit 9 requirement may be too severe for commodities that are rarely and poorly infested. The probit 9 standard is practiced independent of: rates of infestation; gregariousness (single versus multiple infestation); survival and reproductive capacity of the pest; inherent hardiness of the pest to environmental stress during packaging and shipment; packaging and shipping conditions; seasonality of shipment; distribution of commodity; and other biological and nonbiological parameters. In situations where the natural field infestation rate is low and the post-harvest survival and reproductive capacity of the pest are inherently poor, the application of probit 9 standard may be too rigid, impractical, and unnecessary. Following this argument, an alternative treatment efficacy (i.e., treatment efficacy other than probit 9) approach in combination with modifications in inspection and marketing strategies could attain the required quarantine security. In the alternative treatment efficacy approach, the risk is measured as the probability of survival of one or more reproductive units in a shipment.