

Combining lures for multiple unwanted Lepidoptera to improve the efficiency of pest detection and surveillance

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Trapping for surveillance of unwanted invasive species using pheromones and other attractants is conducted in New Zealand and other countries. This can contribute to the early detection of new incursions and provide valuable information for response programmes. In New Zealand, a substantial surveillance is directed at gypsy moth, *Lymantria dispar*, and related species of *Lymantria*, which are important defoliators in forests and urban areas overseas. We tested whether traps can be baited for multiple unwanted species to increase the scope of surveillance and improve cost-effectiveness, without loss of trap sensitivity and detectability of each of the target species. We chose four potential forest and urban lepidopteran pest species that are present in Europe and other countries but not (yet) in New Zealand: gypsy moth (*Lymantria dispar*), fall webworm (*Hyphantria cunea*), pine processionary moth (*Thaumetopoea pityocampa*), and European pine shoot moth (*Rhyacionia buoliana*). Traps with single lures and all possible species combinations were deployed in France, Portugal, Italy and Japan, with up to four lures per trap. There was only limited interference, apparently due to trap saturation, but no evidence for interspecific repellency among lures for these species. To assess what factors may be important in species compatibility/suitability for multiple-species trapping, we combined our results and those of previous studies conducted by the United States Department of Agriculture. For 75 combinations of pheromones, tested singly or in combination, ca. 20% showed no effect on trap catch for any of the species tested. In other cases, one or both species showed an apparent reduction in trap catch. However, for most combinations, trap sensitivity is likely to be sufficient for detection purposes. Our results indicated that the outlook is promising for combining lures in a single trap to improve the range of exotic pests under surveillance, at little additional cost.

