

Wendell Roelofs
Geneva, New York

New hypothesis for pheromone evolution: Relevance to mating disruption?

A long-standing question with mating disruption is whether the continuous application of pheromone over large areas for insect control can result in the evolution of resistance to this tactic. Traditional thinking is that the potential for resistance to pheromones, particularly where long-term use of pheromone effectively controls pest populations, would depend on genetically based variation in production of and response to pheromones. The conundrum, however, is how signal divergence can occur in the face of strong selection pressures against small changes in the signal. It was not anticipated that a species can harbor a nonfunctional gene that could produce a major shift in pheromone blend if activated and generate a population of individuals that would be unaffected by the pheromone applications. We have discovered genes in corn borer populations that provide evidence for such a nonfunctional gene that was activated at some time in the past to give rise to a new species.