

## Mating Disruption/SIR

### EVALUATION OF DIFFERENT PHEROMONE DISPENSING TECHNOLOGIES FOR MATING DISRUPTION OF ORIENTAL FRUIT MOTH IN PEACHES

Arthur M. Agnello

Dept. of Entomology, N.Y.S. Agric. Expt. Station, Geneva, NY

*Keywords:* Isomate M-100, twist tie, Confuse-OFM, paraffin emulsion, 3M MEC-OFM, sprayable pheromone, oriental fruit moth, *Grapholita molesta*, peach, mating disruption

*Abstract:* Mating disruption was evaluated as a control tactic against oriental fruit moth in peaches using twist-ties (Isomate-M), paraffin-based liquid (Confuse-OFM) and sprayable pheromone (3M) formulations in commercial orchards. Pheromone trap catches of male moths were low in the disrupted plots throughout the entire season, remaining essentially at or near zero in most cases, despite considerable population pressure. In one case, however, there was breakthrough in the traps of a Confuse plot that was directly adjacent to an apple planting, which likely had its own population of OFM that was being attracted into the peach plots. Pre-harvest fruit inspection showed fruit damage from OFM feeding and infestation to be quite low in most of the treatments, except in the aforementioned Confuse site, where it surpassed 10%. In summary, all treatments appear to have the potential for acceptable control within plot interiors, but border sprays may need to be incorporated to forestall infestations by moths immigrating from non-disrupted areas when these products are used in typical commercial production areas in western N.Y.

#### **Materials and Methods**

This trial was conducted in mixed plantings of fresh and processing peaches on four commercial farms in Niagara Co., NY. Three types of pheromone dispensing technology were evaluated for efficacy in controlling oriental fruit moth (OFM) infestations when applied against the 2nd and 3rd generations of this pest; the 1st generation was controlled by grower-applied sprays of Asana or Imidan, during the petal fall and shuck split period, directed primarily against plum curculio, *Conotrachelus nenuphar*. Peach varieties included 'Babygold 5', 'Babygold 7', 'Red Haven', 'New Haven', 'Bellaire', 'Jay Daylee', 'Loring', and 'Crest Haven'.

The following treatments were tested in single-plot replicates (ranging in size from 2.5-6.0 acres) at each of the 4 sites:

- 1 – Isomate M-100 ties, applied 6-11 June at a rate of 150/acre.
- 2 – 3M Sprayable Pheromone, applied 3–4 times by the growers beginning mid-June, at 2-week intervals at a rate of 1.7 oz/acre.
- 3 – Confuse-OFM paraffin, applied 2-3 times in each site (6-11 June; 9 July (Kappus only); 2 August (Topp & Murray only); and 13 August (Kappus only), at a rate of 30 g AI/acre (1-2 squirts/tree from a plastic squirt bottle).

Treatment efficacy in depressing adult male trap catch was monitored using 3 Pherocon I wing traps per plot, each baited with a standard Scentry oriental fruit moth lure and checked twice weekly from 11 June to 16 August. Traps were also placed in two nearby orchards not being treated with pheromones to serve as a check. Fruit damage was evaluated at harvest by inspecting 100 fruits from each of 4 trees per plot and graded as either Clean, Sting (nominal

minor damage consisting of evidence of only slight feeding), Internal (more serious damage consisting of tunneling, or presence of frass or live larvae); incidence of cat-facing caused by tarnished plant bug (*Lygus lineolaris*) or other hemipterans was also recorded.

Mean percent fruit damage was transformed using arcsine square root and an analysis of variance plus Fisher's Protected *t*-test was used to compare treatment means (Abacus Concepts 1991).

### **Results and Discussion**

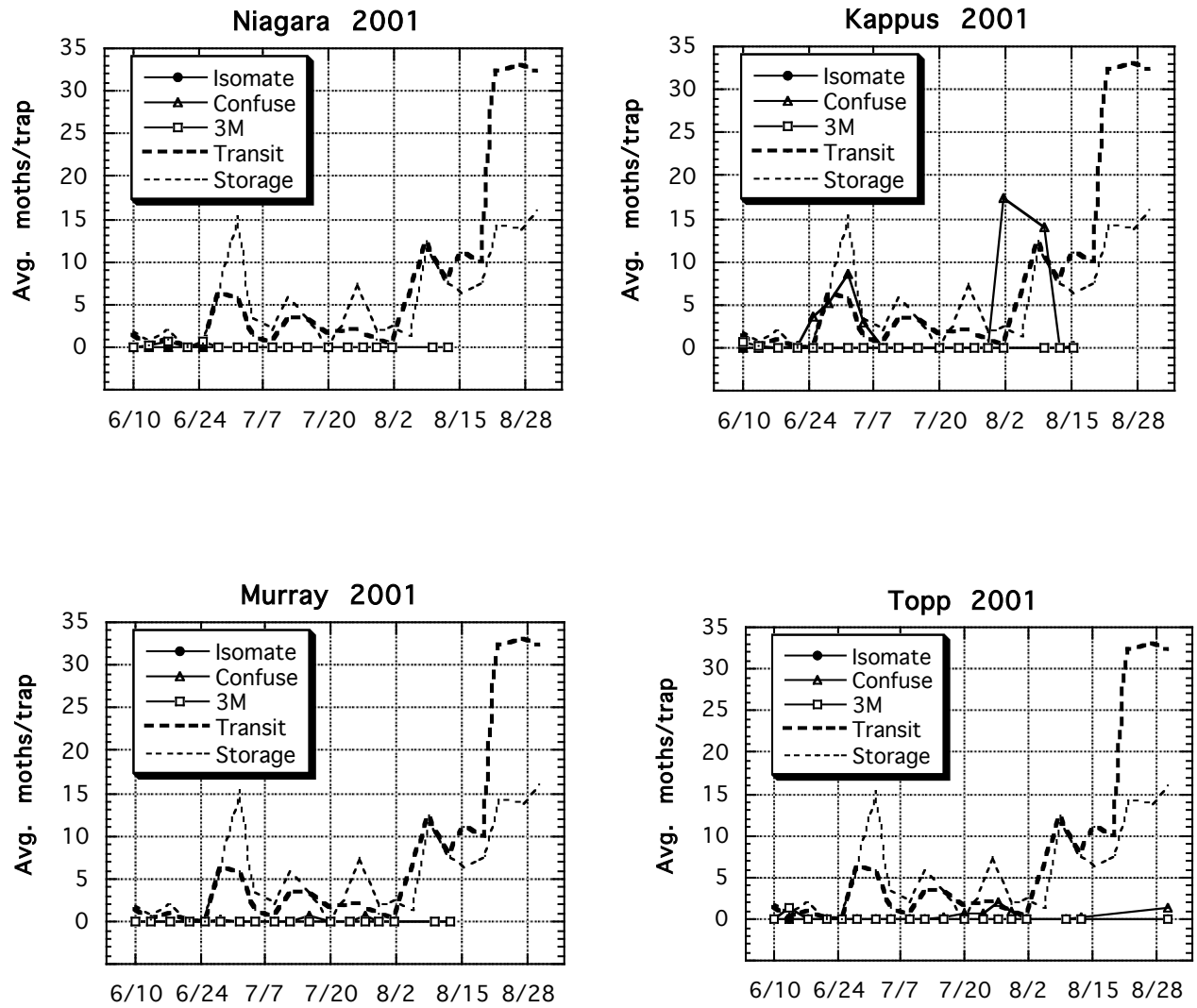
Pheromone trap catches of OFM adult males in the disrupted plots were very low throughout the entire season, essentially remaining at or near zero in most cases despite considerable population pressure, as reflected in the check (Transit and Storage) plots. In one case, at the Kappus site, there was breakthrough in the Confuse plot traps, which occurred at two times, in each case approximately 3 weeks after the treatment's application date. Following re-application, moth numbers returned to zero in both instances. This level of breakthrough was not seen in any of the other plots, and it is assumed that the problem was caused by the fact that the Confuse plot at Kappus was directly adjacent to an apple planting, which likely had its own population of OFM that was being attracted into the traps of the pheromone plot. In general, the growers did a good job of applying the MEC sprayable formulation at the appropriate schedule timings, which is a particularly important aspect of using these products at their highest level of effectiveness.

Results of the pre-harvest fruit inspection showed fruit damage from OFM feeding and infestation to be quite low in most of the treatments. The occurrence of "stings" was generally in the range of 1.5-3.5% in all plots; this category represents skin puncturing or nominal pitting progressing less than a few millimeters into the fruit, attributable to either OFM or some other undetermined cause. An "internal" injury category was reserved for actual tunneling in the fruit flesh, with either the larva or its trail or frass evident when the fruit was cut. Few major differences among treatments were seen except for the Kappus site, where internal larval infestation surpassed 10% in the Confuse plot. This corresponds with the pheromone trap results and corroborates the assumption of mated female immigration from the apples, as the injury level was 3.3% in the Isomate plot (next in line after the Confuse plot) and only 1% in the 3M Sprayable (the plot farthest from the apples). Also, the 3 plots at this site had different harvest dates because of variety differences, and later dates of harvest corresponded with higher fruit damage levels (3M Sprayable, 6 Aug; Isomate M, 16 Aug; Confuse, 27 Aug). Fruits harvested later in the month would have had a longer period of exposure to potential infestation by any immigrating moths.

In summary, all treatments appear to have the potential for acceptable control within plot interiors, but border sprays may need to be incorporated to forestall infestations by moths immigrating from non-disrupted areas when these products are used in typical commercial production areas in western N.Y.

### **References Cited**

**Abacus Concepts, Inc. 1991.** SuperANOVA v1.11. Berkeley, CA



**Fig. 1.** Oriental fruit moth pheromone trap catches in plots treated with different pheromone disruption techniques, Niagara Co. 2001.

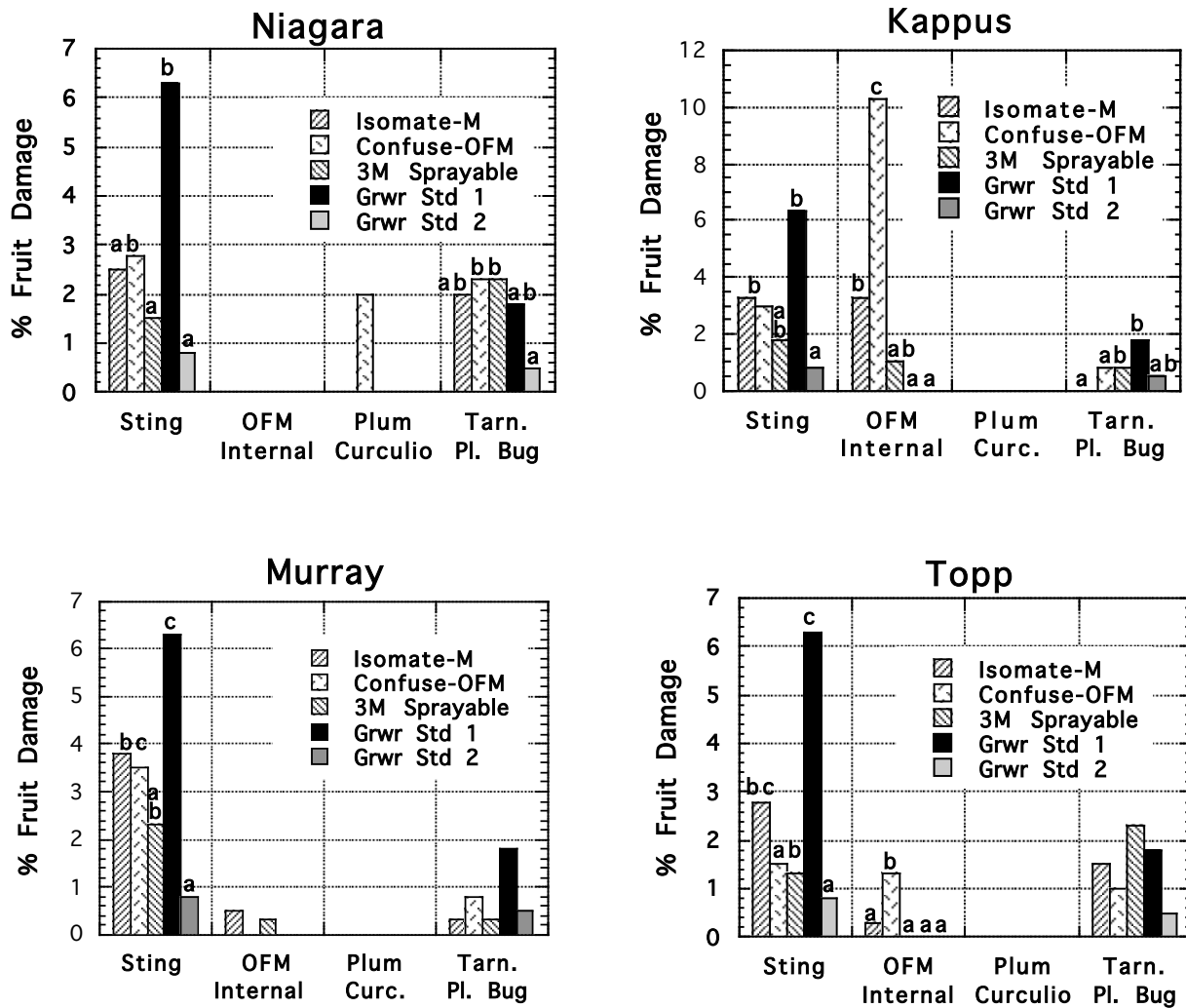


Fig. 2. Fruit injury in peach plots treated with different oriental fruit moth pheromone disruption techniques, Niagara Co. 2001.