Topics on mating disruption

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1. Impurities in Active ingredients for mating disruption
1.1. Alcohol
1.2. Isomer
2. Low efficacy of aldehyde type pheromone in mating disruption
3. Advantage of area wide application of pheromone
4. Possibility of mating disruption against other than Lepidoptera species
5. Resistance to mating disruption

1. Impurities in A.I. for mating disruption

1.1. Alcohol

Almost all acetate type pheromones in sex gland contain alcohol. In some cases the alcohol is a real component like Spodoptera exigua (Z9-14OH) and Homona cofferia(12OH). Usually the content of the alcohol is very low and its function of the alcohol for mating activity is not clear, but we found that a low content of the alcohol enhances the efficacy of mating disruption in some cases and a high content of the alcohol decreases the trap shut down.

1.2 Isomer

For mating disruption, impurities having different stereo structure, different length of carbon chain, double bonds at different position never work as an inhibitor in general.
Therefore we already developed several mixed pheromones.
There are many components in a product but they are no interaction among different chemicals and all target pests can be controlled.
However there are some exemptions. We are trying to control many leafrollers by using Z/E11-14AC(Z:E=96:4). We found Adoxophyes orana, Archips breviplicana, and Pandemis limitata can be controlled by Z/E 11-14AC. But in the case of Pandemis heparana, even only 1 to 2% of E-isomer disturbs mating disruption and 99.9% pure Z11-14AC results in complete mating disruption.

2. Low efficacy of mating disruption by aldehyde type pheromone

In general, acetate type and alcohol type pheromones give good efficacy for mating disruption but aldehyde type pheromones (except Chilo) usually required a higher dosage in order to give good efficacy of mating

disruption.
A famous pheromone professor explained that insects having aldehyde type pheromone, emit pheromone at a bigger quantity than insects having acetate type pheromone, and that a higher dosage is also required against aldehyde type insects for mating disruption. But we found other reason why aldehyde pheromone required a higher release rate.

3. Advantage of area wide application of pheromone

There are many advantages of the area wide control by pheromone as follows:
Low dosage - Growers can reduce the dosage of pheromone dispenser in area wide control programs.
Stable efficacy - Area wide application has more stable efficacy even when the weather condition and the field condition change.
Good efficacy even at late season - We can expect good efficacy even at late season in area wide control programs.
Natural enemies - Area wide IPM with pheromone can conserve populations of natural enemies and can help control miner pests without help of insecticides.
Good quality of agriculture products
Growers can sell their products with low insecticide residues.

5.Resistance to mating disruption

We heard many rumors at past that mating disruption had a resistance problem. But we found that they were not a real resistance and there were several other reasons than resistance.
But we had a real resistance problem in some special cases in mating disruption against leaf rollers.