

## Studies on Disruption of Sexual Communication in the Pink Bollworm

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### Summary

Commercially prepared flake formulations of gossypure or its Z,Z-isomer applied at 1 or 4 g AI/ac, respectively, to 20 ac fields effectively suppressed mating of laboratory-reared virgin female pink bollworms in mini-mating stations and reduced capture of males in Delta traps by 99%. Microencapsulated gossypure or its Z,Z-isomer applied as an aqueous spray at a rate of 5 g AI/ac to 0.1 ac field plots reduced catches of male pink bollworms in Delta traps by about 90% compared to untreated plots.

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We conducted tests of gossypure on its component Z,Z-isomer in laminated flake or microencapsulated dispensers in field plots for disruption of communication in the pink bollworm. Tests were conducted in 0.4 ha field plots on 3 farms in the Phoenix area during the 1982 season. The effects of the test treatments were measured by depression of trap catches of males in Delta traps baited with 1 mg of gossypure and by depression of mating of virgin laboratory-reared females placed in 1 gal mini-mating tables in the plots.

Commercially (Hercon) prepared flake formulations containing either the Z,Z-isomer or gossypure were tested at a rate of 1.5 g AI/ac (ca 2000 flakes/ac). Treatment with the Z,Z-isomer reduced trap catches 89-99% compared to 98-100% for treatments with gossypure in 3 tests. Both treatments effectively suppressed mating of virgin laboratory females in mini-mating stations. Dose rates of 1, 2, or 4 g AI/ac of the Z,Z-isomer gave 81, 91, and 97% reductions in trap catch, respectively. The 4 g dose rate of Z,Z-isomer was then compared to the commercial gossypure flake product at the recommended 1.5 g AI/ac rate by aerial application to 8 ha fields. In this test both treatments reduced trap catch by better than 99.99% compared to an 8 ha control field. No mating of laboratory females in mini-mating stations occurred in two tests in the treated fields while 6 and 11% mating occurred in the control field. The results of these tests indicate that the Z,Z-isomer in commercial flake formulation is effective for disruption of sexual communication of the pink bollworm.

Microencapsulated (Bend Research) gossypure or its Z,Z-isomer were applied by large drop (point source) and spray methods. In an initial efficacy test, the materials were placed on cotton plants in 50  $\mu$ l drops at a rate of 1.5 g AI/ac (10,000 drops/ac). With the exception of gossypure in 1 of 3 replicate tests, mating of females in mini-mating stations was prevented and trap catches were reduced an average of 92% or 91% for the Z,Z-isomer and gossypure treatments, respectively, during a 1 week test period. A comparison of large drops (point sources) as used in the efficacy test and spray application methods was then conducted. Sprays were applied using a Micron Herbi 77<sup>®</sup> hand held spinning disc applicator that was calibrated to deliver  $1.97 \times 10^8$  spray droplets/ac. The two methods were used to apply rates of 1.0 or 5.0 g AI/ac of both materials. An additional commercial-type treatment of Nomate PBW<sup>®</sup> (Albany International) fibers (1.0 g AI in 4000 fibers/ac) was made for comparison (test repeated 3 times in different fields). In this test, the effects of the treatments were measured by reductions in trap catch only. Although the results were variable due to the differences in moth populations in the test fields, it was evident that the 5.0 g/ac rate of microencapsulated materials was necessary to give ca 90% reductions in trap catches for the 9-12 day test periods. Gossypure or its Z,Z-isomer were equivalent in reducing catches when the same rates and method of application were used. However, comparisons of results for large drops vs spray methods indicated the large drops generally resulted in significantly lower trap catches than sprays at the 1.0 g/ac dose rate. At the 5.0 g/ac dose rate the results for the 2 methods of application were similar with average reductions in catch of 85% for sprays and 95% for large drops (no differences between the 2 materials applied). The Nomate PBW gave 97% reductions and was the standard for comparison. The results of our tests indicate that spray application of microencapsulated gossypure or its Z,Z-isomer have potential for communication disruption of the pink bollworm. Somewhat higher application rates of active ingredient appear to be required for sprays, possibly due to different mechanisms of action of point source and spray methods.