

DEVELOPMENT OF TRANSGENIC PINK BOLLWORM FOR USE IN AN AREA-WIDE GENETIC CONTROL PROGRAM: PERSPECTIVES FROM THE LABORATORY ON TECHNICAL AND REGULATORY ISSUES.

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The best known genetic control technology, the sterile insect release technique (SIT), uses radiation to cause genetic damage or sterility to the gametes of the release insect so that all of the progeny from a mating with the wild target pest are nonviable. Use of SIT against pink bollworm (PBW) has proven to be very successful and has been used for over 30 years to protect a large cotton growing area in the Central Valley of California. However, PBW require a high dose of radiation to cause sterility, which causes a significant decline in the performance of the insect. This effect of radiation makes high release rates necessary. As the demands of an expanding PBW eradication program in the western cotton belt put more pressure on limited resources, a more competitive release insect is needed.

To improve the effectiveness of PBW genetic control, two control methods with transgenic insects are in development: a low dose F-1 sterile release strategy using genetically marked PBW (e.g., GFP from jellyfish, DsRed from coral); and the release of a conditionally lethal PBW strain as an alternative or supplement to sterilization by irradiation. Because these two control strategies use either a low dose or no irradiation, the release insect is more competitive allowing lower release rates to be used.

Results from laboratory, field cage, and open field testing of several transgenic strains will be presented along with the regulatory history of the project. Future progress towards potential use in the eradication program will depend on meeting both technical and regulatory challenges.