AUTOCIDAL BIOLOGICAL CONTROL: THE ABC'S OF GENETIC ENGINEERING FOR THE CONTROL OF PEST INSECTS

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We live in an age in which genetic engineering is a reality. Plants have been engineered to be resistant to diseases and ripen on demand. We have used genetic engineering to correct genetic dysfunction in ourselves. It is now time to apply these methods in solving agricultural pest problems. In the area of quarantine treatments, most scientists will agree that no treatment of a commodity is the best treatment. The absence of a direct treatment ensures a quality product with no residual effects following a direct quarantine treatment. The justification for no treatment can be accomplished through the establishment of 'pest-free zones'. A common method used to establish pest free zones is through the application of a procedure called 'SIT' or Sterile Insect Technique. This method has been proven to be extremely effective in the eradication of screwworm and control of tropical fruit flies. SIT relies upon the release of radiation sterilized males. Irradiation causes damage beyond mere sterilization, and may produce males that are not competitive or viable for mating. It is also very labor intensive and expensive to isolate males from traditional laboratory cultures. AUTOCIDAL Biological Control (ABC) can circumvent these problems. ABC involves direct genetic control of insects through the manipulation of known metabolic functions. This type of approach was suggested by E. Knippling many years before genetic engineering was a reality. The basic principles of ABC will be outlined and the potential applications will be discussed.