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## Development of mechanized application method for applying “Pheromone Gel” in cotton

The evolution of pheromone application technology, as it pertains to cotton in an active eradication program, consists of three (3) approaches.

First- the mainstay of protocol, at least in Arizona, has been the application of pheromone “rope” to all non-Bt cotton prior to pin square. This product gives us the longest release rate over time. The Arizona Cotton Research & Protection Council developed a mechanized method of applying rope to fields (modified transplanters) that has successfully replaced the need for large hand labor crews.

Second- of fields that needed additional mid/late season applications of pheromone, our options were limited to air application of pheromone fiber, which could be flown alone or as a “dual” application with insecticides (requires special equipment); or the addition of MEC, a liquid formulation of pheromone designed to be tank mixed with insecticides (applied by air or ground). Both these products have considerably shorter release curves than rope.

The third approach is designed to reduce costs of the aggressive early eradication “proactive” protocol, by treating non-Bt cotton on an “as needed,” or “reactive” protocol in areas that are reaching completion of the program and dealing only with “non-resident” migratory PBW populations. This method is also “mechanized” and applies a pheromone “gel” over the top of designated rows of cotton at any growth stage. This technique allows managers to wait beyond pin square and treat only those fields that might develop a threat from migration on a field-by-field basis.

The equipment utilized to apply the gel consists of the same drive system used with the “transplanters.” A hydraulic orbit motor turns a clutch brake which receives a 12 volt signal from a sensor box engaging the pump for one revolution and dispensing a pre-determined amount of gel at a pre-determined distance, linearly, down selected rows of cotton. This allows for very small quantities of pheromone to be applied (one gallon of gel treats over 36 acres). The pump is a “John Blue” squeeze pump modified to apply material through two hoses (i.e. two rows of cotton- or every fourth row). The equipment can be mounted on high-clearance tractors for application to all stages of cotton growth.