

THE BACKCROSS STERILITY TECHNIQUE

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ABSTRACT

The sterile insect technique (SIT) and the induced inherited (F_1) sterility technique have been investigated for a number of lepidopterous pests, including the gypsy moths. Another technique, backcross sterility, which could potentially prove as or more useful for control of pest species has been developed for the control of only one lepidopteran species, *Heliothis virescens*. This genetic technique has several theoretical advantages over both SIT and the F_1 sterility techniques. In contrast to F_1 sterility, backcross sterility can persist indefinitely once introduced into a population. Because fertile females are continuously backcrossed to target males, the strain becomes increasingly genetically similar to the target species. The backcross strain should also be behaviorally similar to the target species and there are no radiation-induced effects on competitiveness.

Because of these potential benefits, approximately a year and a half ago we initiated a project to screen for backcross sterility with the gypsy moth and other closely-related lymantriid species. The first species we selected was *Lymantria obfuscata*, a species from India. To date we have hybridized *L. dispar* and *L. obfuscata* and are in the process of making the appropriate backcrosses. At this time, it is too early to determine the outcome of these particular crosses. We plan to continue to screen additional *Lymantria* species to determine if backcross sterility can be developed and applied as a technique for use in the management of gypsy moth populations.