

OUTCROSSING COLONIES OF THE OTIS NEW JERSEY GYPSY MOTH STRAIN AND ITS EFFECT ON PROGENY DEVELOPMENT

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ABSTRACT

The Otis New Jersey gypsy moth (*Lymantria dispar* L.) strain is considered the "white rat" of gypsy moth research. This strain has been laboratory reared for 34 generations. It currently consist of 35 subcolonies or cohorts that have been genetically isolated from one another for several generations. Usually, larvae that hatch at the same time develop synchronously; however, in recent years this strain has been plagued by periods of asynchronous larval growth (straggling) and other performance abnormalities. These abnormalities are now collectively called *Abnormal Performance Syndrome* (APS).

It was hypothesized that APS may be caused by the intense inbreeding within subcolonies. During 1989, the Otis Rearing Facility made outcrosses between subcolonies placed into cold storage in adjacent weeks. The progeny from the outcrossed lines were compared to those of the pure bred lines to determine if outcrossing had any influence on the incidence of APS and/or survival in the G₁ generation.

APS was not detected in either the outcross or pure lines and therefore we could not determine if outcrossing would have had any effect on the incidence of APS in the G₁ generation. Parents used to produce these crosses had a high incidence of APS, indicating that APS is probably not caused by genetic factors but by environmental, nutritional and/or microbial factors that affect the parental generation but are not expressed until the G₁ generation, or affect the G₁ eggs shortly after they are deposited.

Outcrossing did not have any influence on survival of G₁ generation insects. Both the outcross and pure lines had greater than 90% pupation and adult emergence. This high survival rate also indicates that APS was not present in the G₁ generation.