

## **USDA/APHIS Confinement Workshop, September 13 – 15, 2004**

Breakout group 1 – Wind pollinated crops. Strategies for Confinement

Practical Application of Time and Distance as Redundant Systems for Biological Confinement in Maize

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### **Abstract**

Studies were conducted in CA to evaluate the relationship of distance and temporal separation for isolation of maize from pollen-mediated gene flow (PMGF). Kernel color was used to detect outcrossing from source plots of 0.4 to 1.2 ha to receptor plots planted at distances up to 750 m and planting intervals of up to three weeks from the pollen source. Outcrossing from source to receptor plots was observed to ~0.0002% (1 kernel in ~500,000 kernels).

Increasing temporal separation reduced the distance required to achieve genetic isolation. Outcrossing was <0.01% at 500 m when source and receptors flowered at the same time, whereas this level of confinement was achieved at 62 m when two weeks of temporal separation (335 gdu) was used. No outcrossing was detected at 750 m and two weeks of temporal separation. The time main effect and the interaction of time and distance were highly significant ( $p < 0.0001$ ). Hence, time and distance do not act independently. Isolation standards invoking both will be most realistic when derived from empirical data in which both systems are studied concurrently

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