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## Pest Problems Abroad May Affect Compliance With U.S. Safeguards

Ninety-five percent of Mediterranean fruit fly (medfly) outbreaks in the continental United States since 1929 have occurred in Florida and California. USDA, along with California's and Florida's departments of agriculture, use preventive release programs to reduce the severity and frequency of outbreaks. Millions of

sterile male fruit flies are released weekly where outbreaks have occurred. If a wild, fertile female medfly is nearby, she is likely to mate with a sterile male, produce eggs that do not hatch, and be unable to mate again.

Medflies are known to exist in 65 countries that export fresh produce to the United States. Because female medflies lay their eggs inside the produce, USDA regulates fresh produce importation to reduce the rate of new invasions. Among the approved and commonly applied ways to eliminate medfly larvae is cold treatment: refrigeration at a mandatory average temperature for a specific time period.

Live medflies were confirmed in separate shipments of clementines from Spain in 2001, prompting USDA to amend regulations governing their importation and the cold treatment of fresh produce from all known medfly regions. Subsequent analysis by USDA's Animal and Plant Health Inspection Service suggested that the specified duration of treatment may not have achieved satisfactory control; therefore, USDA extended the required length of the treatment time.

Using a simulation model, ERS examined treatment schedules that maximize

U.S. produce consumers' and producers' net benefits from efforts to control fruit fly outbreaks. In the model, a representative foreign producer exports a fraction of production to the United States and the remainder to the rest of the world, and implements medfly controls to maximize profit. If medflies survive pesticide sprays and cold treatment abroad, as well as the domestic preventive release program, an outbreak causes domestic yield losses and production cost increases in the U.S.

The results of the analysis show that the economically optimal number of days to treat imports increases with the severity of medfly outbreaks abroad. The optimal treatment schedules are very similar to current treatment schedules. The treatment period that maximizes foreign producer profit also varies with the severity of outbreaks. When local infestations are at or below average, the results suggest that economic incentives abroad are consistent with U.S. policy. However, when local infestations are above average, foreign producers have an economic incentive to treat their produce below the U.S. optimal level. This occurs because yield losses and control costs increase with the severity of outbreaks to the point where profit is maximized at a treatment level lower than the U.S. optimal level. The disparity between U.S. goals and foreign producers' incentives shows the importance of monitoring compliance with cold treatment regulations and provides justification for USDA's practice of doing so.  $\mathbb{W}$

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### This finding is drawn from ...

"The Mediterranean Fruit Fly and the United States: Is the Probit 9 Level of Quarantine Security Efficient?" by Michael Livingston, in *Canadian Journal of Agricultural Economics*, 55(2007):515-526.

### Optimal cold treatment schedules for medfly infestations may differ from treatments designed to maximize foreign producers' profits

Medfly outbreak severity abroad	Optimal treatment for United States		Optimal treatment for representative foreign producer	
	Days	$^{\circ}F$	Days	$^{\circ}F$
Below average	8	32.5	9	32.5
Average	11	32.5	11	32.5
Above average	12	33.0	11	32.5

Source: Livingston, M. J. "The Mediterranean Fruit Fly and the United States: Is the Probit 9 Level of Quarantine Security Efficient?" *Canadian Journal of Agricultural Economics*, 55 (2007):515-526.