

A New Buzz in the Medfly Debate

The state of California and a dissenting entomologist are slugging it out over how to deal with this costly pest

HAS THE MEDFLY REALLY BEEN WIPED OUT IN Los Angeles? That simple question is at the heart of a long-running political controversy with big implications for California's \$16-billion dollar agricultural industry. The state claims last year's unpopular aerial spraying of the pesticide malathion has wiped the critters out—just as dousings in previous years, it says, knocked out earlier infestations. But entomologist James Carey of the University of California at Davis says the victory proclamation was motivated more by politics than by science. Carey (who presents his views on p. 1369 of this issue of *Science*) believes the medfly has, over the last decade, established permanent residence in Los Angeles—and that subtler strategies than dousing the area with pesticide are needed to lick the problem.

So who's right? The story is still so tangled that despite the high stakes (if Carey is right, other countries could look askance at California's fruit exports), it's not possible to say for sure. But to get a feel for the story, you need to back up a year and a half, to when Carey began his one-man crusade to persuade the state to reassess the medfly problem (see *Science*, 9 March 1990, p. 1168). Since then, this entomological David and his Goliath-like opponent, the California Department of Food and Agriculture (CDFA), have kept trading the same heated charges.

Although the two sides remain far apart, Carey's campaign has had an effect. In response to Carey's alert, the University of California convened a scientific panel in May 1990 to evaluate all the existing medfly data. The eight entomologists and statisticians from around the country came down a bit closer to Carey's side than to CDFA's. According to panel chair Robert Van Steenwyk, of UC Berkeley, the group felt that the 1989-90 infestation "could be traced back fairly confidently" to the infestations of '88 and '87. That means the flies may never have been completely eradicated during that time—despite the state's claims.

California's chief entomologist George Loughner now accepts the panel's view: "By the time we detect a population, it could be biologically possible that flies could have spread to other areas," he says. And that, he admits, could mean medflies have been hopperscotching around Los Angeles for a num-

ber of years. But Loughner and Carey are still far from seeing eye-to-eye. Loughner, for example, thinks there are isolated satellite colonies that eventually are detected and wiped out, while Carey feels the medfly is much more widely established—a condition he compares to metastatic cancer that can be kept in remission but never cured.

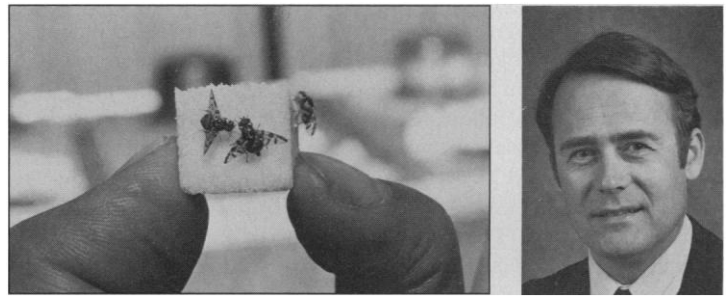
The CDFA's view, even in its current form, depends on medflies regularly entering California in infested fruit. The UC panel proposed a test of that hypothesis—a thorough search of fruit coming in by air, sea or mail, to see if there was enough medfly influx to explain the repeated outbreaks. But "inspection blitzes" earlier this summer of cargo on flights and ships from medfly-infested areas such as Hawaii and Central America didn't turn up a single medfly, and a continual inspection last June through October of all mail from Hawaii revealed only two infested packages bound for the Los Angeles area.

But, as in most aspects of this controversy, the meaning of the data depends on whom you ask. Carey finds the influx too low to explain the medfly outbreaks. But Loughner, looking at the same data, argues that, while the influx in the past was sufficient to reintroduce the fly repeatedly, "efforts to get people not to bring in contraband fruit are working." In his paper, Carey disputes that view, with evidence that the introduction rate has always been low.

As if that exchange weren't frustrating enough, a plan to test Carey's "continuous infestation" hypothesis never even got off the drawing board. The experiment, drawn up last year by Carey and the CDFA, called for as many as 10,000 traps to be placed in each of several square-mile tracts in Los Angeles to see if low-level medfly populations were hiding there. The CDFA nixed the idea because of the expense and the uncertainty that it could be conclusive, given the poor performance of medfly traps.

Indeed, one thing that everyone agrees on is the pitiful weakness of the attractants used in medfly traps. University of Hawaii entomologist Kenneth Kaneshiro, for instance, found that a trap less than 10 meters from a large medfly population in Hawaii did not catch a single fly. That, he says, renders California's medfly detection program "seriously inadequate."

An ideal solution to the problem would be a more powerful lure—something so attractive that it would not only improve trap efficiency, but also make it possible to abandon the unpopular aerial malathion spraying and exploit an annihilation scheme used successfully on the oriental fruitfly: a strong attractant is mixed with pesticide, flies flock to the site and are killed. With dreams of such results, the state has awarded the biggest chunk of the medfly research



Los Angeles flyby. *Jim Carey thinks the medfly has become a permanent resident of Orange County; the state disagrees.*

money (\$431,000 out of a total of about \$850,000) to a USDA program in Guatemala to study an attractant called "ceralure." But Kaneshiro and Carey say the hope for a better lure is pie in the sky. Ceralure is no more attractive than the lure currently in use, they say, and medfly behavior is so different from that of the oriental fruitfly that a sufficiently powerful attractant is likely never to be found. They say the state's money would be much better spent on research into the genetics and basic biology of the medfly. Genetic markers would enable the true origin of each infestation to be traced, and a better biological understanding could lead to effective controls.

In the face of this scientific opposition, why is CDFA spending such a big chunk of its money on the ceralure project? The answer, says Carey, is simple: politics. Los Angeles residents don't like being doused with malathion, so it makes good PR for CDFA to be conspicuously searching for an alternative. Even project director Darrell Chambers admits ceralure's promise is limited, and says the program is driven by "the climate of unacceptability of aerial applications [of malathion]." Or, to put it another way, when the subject is medflies and the state is California, politics is unlikely to move over to clear the way for science. ■ **MARCIA BARINAGA**