Screwworm

CURRENT STATUS: SCREWWORM BARRIER MAINTENANCE PROGRAM IN PANAMA (COPEG)

Were it not for the Screwworm Program in Panama managed by the Panama and US Governments, all countries of North and Central America would be suffering the results of a Western Hemisphere native flesh-devouring insect. This insect, the screwworm, was a traditional limitation to animal agriculture in North and Central America, and is still a significant economic disease of livestock in South America. New born animals were attacked through their fresh umbilical cord, and all animals wounded at any stage of their lives were subject to being "drilled" to death. It must also be noted that the human population (and indeed all mammals) were severely affected by this pest in North and Central America before this program began (1950s) and until we reached the current barrier (2000s).

All stakeholders have an interest in the viability of the Program and its continuity in perpetuity. Were the barrier not maintained, the fly would migrate again northward, and re-establish itself within its

former ecologic range. This range could well be more extensive due to climate change. It is limited by large bodies of water, high altitudes, and where the ground freezes for several inches. Interested stakeholders include, but are not limited to, all livestock growers (cattle, swine, sheep, goat, other small mammals), all meat-based industries, State and Federal governments, exporters and importers of live animals, and of course, the human population and public health officials.

The barrier against South America is maintained by producing millions of flies in the Panama laboratory/production facility, sterilizing these flies with the use of cobalt, and releasing the flies by airplane over the barrier (extreme eastern Panama and 20 miles into the country of Colombia). With the release of the millions of sterile flies, the likelihood that a native fertile male fly will find a native fertile female fly, becomes extremely improbable, and the fly population disappears. The flies are produced in a major industrial facility, more akin to a factory than a laboratory. This physical plant lies between the City of Panama and the Colombian border. The Program employs approximately 400 individuals and the cost of running this operation is about 15 million dollars per year (2014). This is a tiny cost compared to the billions of dollars in losses in North American livestock were the fly not eradicated, and compared to the tens of thousands of animal handlers and public health officials necessary if the fly were still present in North America.

The Program is divided into four technical divisions and two administrative divisions. Among the four technical divisions is included: Production, Research and Development, Engineering, and the Field Surveillance-Quarantine-Dispersal divisions. The two administrative divisions include a General Administrative division as well as the Office of the General Directors.

The Production division is in charge of implementing a very detailed procedure of fertile fly colony maintenance, egg collection, growth of the fly from the egg through three larval stages to a pupae stage, and the irradiation of the pupae to sterilize an otherwise healthy fly.

The Research and Development division is in constant collaboration with Agriculture Research Service (USDA ARS) and others to look for efficiencies, cost effectiveness, higher quality production, and more sustainability through the use of better science.

The Engineering division is focused on the maintenance and repair of the physical plant, but also contracting and oversight of outside contractors which are brought into expand and improve plant operations.

The Field division receives the sterile pupae, rears them to adult flies, loads these onto aircraft for air dispersal over the barrier, and the monitoring of the effect of these sterile flies in the field. Any suspected case of any fly infestation is investigated, and the organism is identified. A system of sentinel farms and collaborators from local communities serves as an early warning system. In the case of outbreaks, this division conducts the field investigations and recommends remedial actions to insure that the fly does not re-establish itself, including additional fly dispersal if necessary.

All of these efforts at the barrier can be negated if any country to the north of the barrier imports live animals infested with screwworm from those other countries of the Americas which are still infested: most of South America and many islands of the Caribbean. Live animal imports can include the principal agriculture mammal species (horses, cattle, pigs, sheep and goats), domestic pets (dogs, cats, rabbits, some rodents), and of course humans themselves. In 2013, a tourist to Peru returned to England with living, fertile screwworm larva in her ear canal. For this reason, the Program is continuously looking for collaboration with the North American screwworm free nations to maintain import protocols and quarantine processes ever vigilant, as well as vigorous field surveillance and

public information campaigns in all free countries. In the case of an outbreak to the north of the barrier, a series of activities would ensue to isolate the incipient fly population, and this could go so far as the dispersal of infested areas with sterile screwworm flies from the Program in Panama; the Program is the only source currently in the world for sterile New World screwworm flies.

As an interesting aside, New World Screwworm was introduced to North Africa in the 1980s, by a shipment of livestock from South America. This is the first recorded introduction to the Old World of the New World Screwworm. In a broad collaboration among the Libyan, US and Mexican Governments, and the Food and Agriculture Organization (FAO) and others, the fly was eradiated from Libya. Other international organizations involved in ongoing collaborations include the International Atomic Energy Agency (IAEA), the Interamerican Institute for Cooperation in Agriculture (IICA), the International Regional Organization for Plant and Animal Health (OIRSA in Spanish), and the Pan American Health Organization (PAHO).

History of the Screwworm Program

Screwworm Program Staff

USDA-Agricultural Research Service (ARS)