

Screwworm Eradication Success in Texas, Mexico and Central America

The Southwestern Branch of the Entomological Society of America includes Oklahoma, Mexico, New Mexico, and Texas. Historically, screwworm eradication was one of the most significant events to occur in this region. Dr. Edward F. Knipling and Raymond C. Bushland with the USDA-ARS developed the sterile- insect release method in the 1950's that eradicated the screwworm fly from the Southern United States, Mexico, and Africa. This technique has also been used to eradicate and control other pests such as the Mediterranean and other fruit flies in other parts of the world. This concept has significantly advanced our knowledge of pest management and introduced the principles of area-wide pest management to the scientific community and production agriculture.

- The program to rid the Southwest of this pest began in 1962, when the first planeload of sterile flies was dispatched from Austin and dropped over the Texas Hill Country.
- Eradication was achieved in 1966 and Texas has not had an active screwworm case since August 1992. Mexico was declared free of screwworms in March 1991, after no worm cases were confirmed for the required period of 6 months.
- The USDA estimates that the eradication program provided \$3.4 billion in economic benefits to Texans. Since the pest was eradicated, livestock producers and customers have saved an estimated \$10 billion in the U.S. and \$2 billion in Mexico.

How did it work?

- Male flies produced in large numbers and released into the environment, out-compete wild fertile males in breeding with females. Because female flies only mate once, those that were bred with sterile males laid infertile eggs and thus did not produce any progeny.
- H. J. Muller (*American Scientist* Jan. 1950) reported that fruit flies could be sterilized by exposure to e-rays. C. Bushland, using an e-ray laboratory in a San Antonio army hospital found, that an appropriate dose of e-rays to the pupal stage could produce sterile, but otherwise healthy males.
- The first attempt at eradication occurred in 1954 on the island of Curacao where 170,000 flies per week reared in Florida were released, eradicating this pest from the island over several months or about three generations. The program expanded to Florida and the southeastern U.S., where eradication was achieved by 1959.

Modified from M. Mahoney. 1991. "Central America is target of screwworm eradication effort. *Extension Today*, p. 7, by B. M. Drees; reviewed by Bonnie Pendleton.

Image 1. Dr. E. F. Knipling (1996), formerly an USDA-ARS entomologist, has received the National Medal of Science, awarded by the President of the United States in 1966; the President's Award for Distinguished Federal Civilian Service awarded by the President of the United States in 1971; the UN/FAO Recognition Award for Research in 1991; the World Food Prize in 1992; and the Japanese Prize in 1995. In 1996, Dr. Knipling was the recipient of an Honorary Doctorate Degree from Texas A&M University.

Image 2. Map of screwworm eradication projections in Central America (1991)



Image 1 - Dr. E.F. Knipling

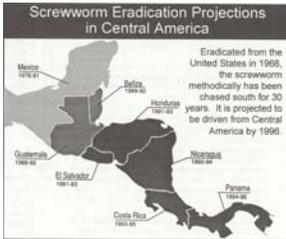


Image 2 - Map of screwworm eradication projections