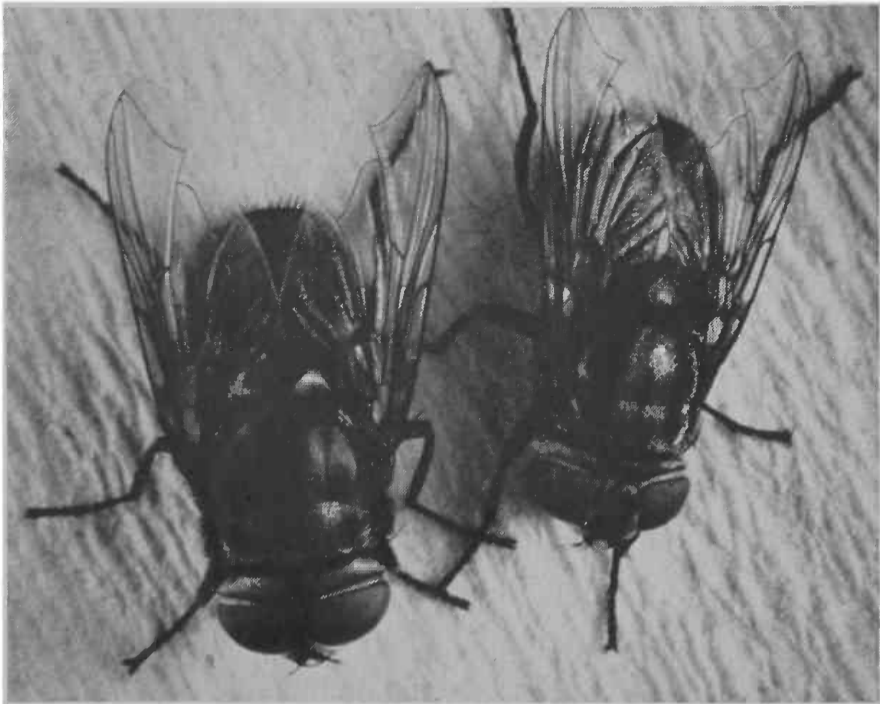


# Screwworm Eradication Reduced to a Barrier Program



**THE SCREWWORM FLY** is about twice the size of the house-fly. It is difficult to distinguish from other flies, but has a bluish-green body with three dark stripes along the back, and an orange-colored head.

By Dr. Ted Rea, Dr. L. N. Butler,  
Dr. John R. Tweed, and Dr. Floyd Smith

As a scourge of the livestock industry, the screwworm has little equal. It has, for 125 years, been a major cause of livestock losses which have amounted to more than \$100,000,000 annually.

The screwworm, so named because of the tapering appearance of the larvae, is actually a maggot which hatches from eggs deposited by a female screwworm fly around the edge of man made or natural wounds on livestock. Since screwworms feed on living tissue they can cause serious debilitation or death of the animal host.

An intensive eradication campaign for the past 10 years against this pest has for all practical purposes eliminated it from the United States.

Eradication has been accomplished by the release of screwworm flies sterilized by exposure to radioactive Cobalt 60. The sterilization of the flies is done during the pupae stage at the sterile-fly-production plant located at Mission, Texas. The screwworms involved at the production plant are reared at the average rate of about 115,000,000 flies per week. The sterilized pupae are packaged in cardboard cartons and stored under humidity and temperature conditions developed to such a perfection that the fly will emerge about the same time the cartons are dropped from aircraft.

The release of sterile flies creates a situation in screwworm infested areas whereby the "so-called" artificial fly population overwhelms the natural population through breeding practices unique for the screwworm

Dr. Rea Veterinarian in Charge, Animal Health Division, U. S. Department of Agriculture, located at Phoenix; Dr. Butler is Executive Secretary of the State Livestock Sanitary Board, Phoenix; Dr. Tweed is Assistant Veterinarian in Charge, Animal Health Division, U. S. Department of Agriculture, located at Phoenix, and Dr. Smith is Epidemiologist, Animal Health Division, U. S. Department of Agriculture, located at Douglas, Ariz.



**PROTECTING ANIMALS** from cuts and scratches and treating unavoidable wounds such as the navel of newborn calves are recommended for preventing screwworm infestation.



**REARING LARGE NUMBER** of sterile screwworm flies needed for the eradication program requires tremendous numbers of larvae. They are fed on a mixture of animal flesh, dried blood and other ingredients. After feeding for three to five days, the larvae migrate from this food mixture to water-conveying troughs in the floor under grates. They are then carried to the pupation room for the next stage in their life cycle.

fly. The significant fact about the breeding practices is that the female screwworm fly breeds only once in her lifetime. If bred by a sterile male fly, reproduction of the species beyond the egg stage is not possible.

Officially the screwworm has been eradicated from the entire United States, including the Southwest. This does not mean that some areas in the Southwest still are not involved in the screwworm program. Portions of Texas, New Mexico, Arizona and California have been

included in a designated barrier zone due to the fact that these areas are still suffering some migration of the screwworm fly from Mexico. To strengthen this barrier zone a similar zone has been designated in Mexico. Actually, at this stage of eradication, the program is more properly designated as a barrier program.

Because of the geographical location of the screwworm problem, in U. S. and Mexican states on both sides of the international border, collaboration of ranchers and livestock health officials of both countries has been required in this program. The success of the program is a tribute to such cooperation, with Mexican officials and ranchers working as vigorously to eradicate the screw-



**AFTER LARVAE HAVE** pupated, about 31,500 are placed in each canister, the canisters then automatically carried into a Cobalt-60 chamber, where the screwworm flies are sexually sterilized by exposure to gamma rays. The remote control mechanism, lead shields and constant checking protect persons working on this project as well as other persons in the vicinity.

worm as their counterparts in the United States.

Eradication of the screwworm has saved the livestock industry and the consumer many millions of dollars more than the cost of the program. Savings to the producer alone in locating and treating infested wounds of livestock has amounted to many millions of dollars annually. The major savings, however, have been in preventing weight losses, low productivity, and death in affected livestock. Wildlife has also benefited tremendously by the program.

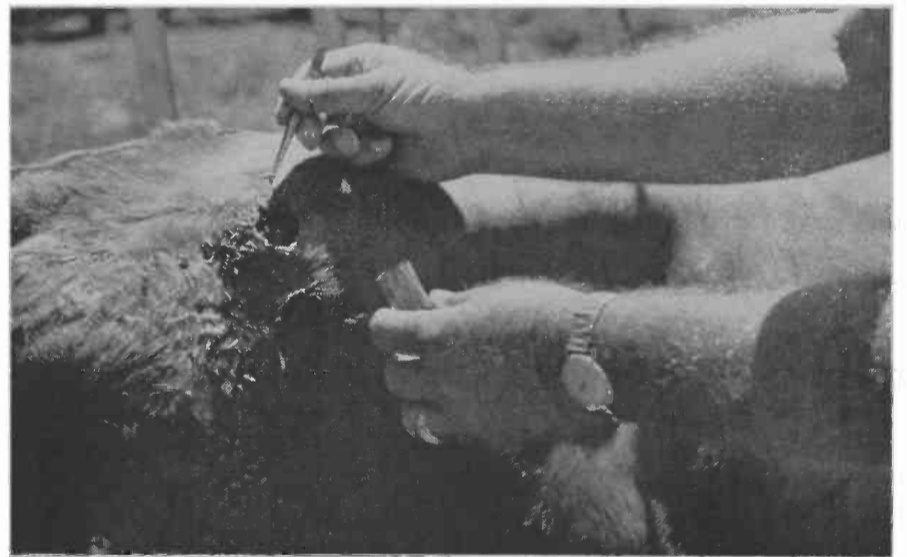
The barrier zone established in the United States and in Mexico will keep the screwworm from gaining a foothold once again in the United States. This zone must receive the concentrated efforts of program officials, livestock owners, state governments, and both the United States and Mexican federal governments. Mexican and American inspectors operate as a network within the barrier seeking infestations, encouraging rancher cooperation, and coordinating ground activities with the systematic and strategic sterile fly aerial bombardment.

Major emphasis is placed on areas where over-wintering of the screwworm is possible. Isolated areas in northern Sonora, Chihuahua and Baja California receive concentrated treatment of sterile flies during winter months when native fly populations are at the lowest.

Climatic conditions affect screwworm activity in two ways. Screwworm flies are most active and prolific during warm humid weather. During dry seasons, fly activity generally will be confined to areas of highest moisture content (river valleys and irrigated regions) and total livestock population will generally be lower due to poor desert grazing. During and following wet periods, however, all factors encourage the fly; natural migration is possible to all areas. Large numbers of cattle are moved into desert grazing areas. Ranching activities increase with a resulting increase in susceptible wounds.

The barrier is not a continuous wall of sterile flies along the border as might be expected. There are desert areas where screwworm activity rarely if ever occurs. Other areas are affected only during certain periods of the year. To disperse flies most effectively within the barrier, constant epidemiological studies are conducted.

In the event a screwworm case is reported by a rancher or an inspector, the exact location is reported to the Screwworm Distribution Center at Douglas. Planes



**RANCHERS CAN HELP** to make the eradication program successful by collecting maggots or eggs present in wounds and sending them to a county agent, livestock inspector or a veterinarian for positive identification.

are dispatched and 100,000 sterile screwworm flies are released at this point. The infested area receives three such sterile fly treatments. In addition, the ground forces make thorough epidemiological studies to determine the extent of infestation and where it came from. The livestock owner is encouraged to participate in a spraying program to supplement the sterile fly drop.

As long as migration of fertile flies from the south remains a threat, reinfestation of the United States is possible. Constant vigil will be necessary. Rapid collection and submission of larvae is a must. Treating wounds with an effective medication is as important today as it was before eradication occurred.