Foreign Animal Disease Report

United States Department of Agriculture
Animal and Plant Health Inspection Service
Veterinary Services
Emergency Programs

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In This Issue--

Current Events

Exotic Newcastle Disease, 1983

Exotic Newcastle disease, a foreign disease of poultry and other birds, was found in baby yellow-naped Amazon parrots in an aviary on Long Island, New York; in Fremont and Santa Rosa, California; and Las Vegas, Nevada, during March 1983.

The disease was first diagnosed by the Animal and Plant Health Inspection Service National Veterinary Services Laboratories at Ames, Iowa, from samples submitted from the aviary of Richard King, Rosedale, New York.

The 25 birds on the premises were humanely destroyed and indemnities paid to help compensate Mr. King for his loss. All birds associated with the Rosedale premises were traced in an effort to find out where the disease came from and where it might spread. Through this effort, exotic Newcastle disease virus was identified at a premises in Santa Rosa, California, from which Mr. King had recently received the sick birds.

The disease was also confirmed in specimens from two locations in Las Vegas, Nevada, apparently unrelated to the cases in California and New York. Several other laboratory and field investigations were in progress at the time this article went to press.

Although exotic Newcastle disease causes high mortality in poultry and most cage bird species, it poses no health risk to consumers of poultry and eggs. However, the virus can cause an eye and upper respiratory system infection in people.
(APHIS News Center, 301 436-7799)

Vesicular Stomatitis Update

The continuing outbreak of vesicular stomatitis that started in the summer of 1982 has resulted in 1,087 investigations with 608 laboratory tests showing New Jersey type vesicular stomatitis in 14 States. The States affected are listed in the order of

numbers of cases reported, with the highest listed first: Colorado, Idaho, Wyoming, New Mexico, Utah, California, Montana, Arizona, Nebraska, Washington, Kansas, Oregon, South Dakota, and Missouri.

The majority of cases have been cattle, with the greatest economics losses in dairy cattle. Vesicular lesions appeared predominantly on the teats and mucosa of the lips, tongue, and mouth. Loss of appetite, decreased body weight, and decreased milk production were especially apparent in lactating dairy cows.

The disease was confirmed in a dairy herd in New Mexico, March 10, 1983. Twenty-eight cows from Colorado were added to the herd of 670 cattle on January 6, 1983. History indicates that the virus was transmitted by the Colorado cows. On March 18 the disease was reported to be spreading to other pens on the New Mexico premises.

Past epidemics of vesicular stomatitis in this country have occurred at intervals of 10 to 15 years. Each outbreak abated rapidly at the end of the autumn season. However, the 1982-83 outbreak did not adhere to this pattern and continued at a reduced rate into the winter season. There were 95 laboratory isolations of New Jersey type vesicular stomatitis virus in the United States during the period November 1982 to March 1983. The disease was confirmed in 31 cattle and a horse during the period January 1 to March 29, 1983. (Dr. K. A. Hand and Dr. A. A. Furr, 301 436-8065)

Denmark FMD Update

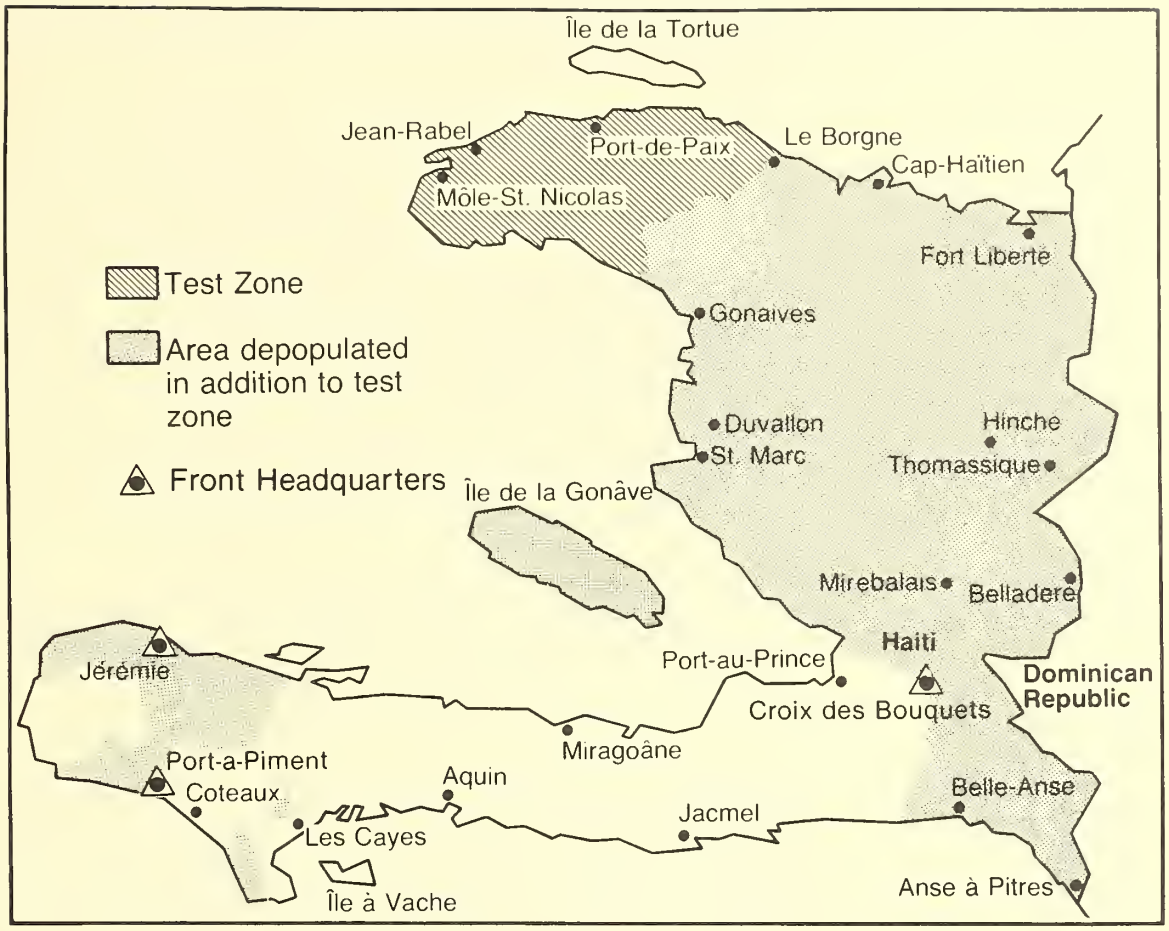
All livestock were eliminated from a farm near Odensa, Denmark, on the Island of Funen, January 14, 1983, following laboratory confirmation of foot-and-mouth disease (FMD) there on the preceding day. The premises was cleaned and disinfected and a 15-km control zone established to prevent possible spread of the FMD virus.

Dr. J. M. Westergaard, of the Danish Veterinary Directorate, reports that a serological survey of the herds situated within a 2-km protective zone has been completed. Totals of 357 cattle, 401 swine, and 60 sheep were sampled. None had FMD antibodies. An additional 939 cattle and 768 sheep from the island of Funen were shown to be free of FMD antibodies. (Dr. K. A. Hand, 301 436-8065)

Haiti ASF Program Update

The Cooperative African swine fever (ASF) eradication program in Haiti, reported in earlier issues of Foreign Animal Disease Report, is continuing on schedule.

By March 25, 1983, a total of 197,991 head of swine had been depopulated and $5,235,910 paid to the swine owners.



Shaded areas on the map show the geographic areas depopulated.

The entire Haitian-Dominican Republic border has been cleared of swine. Depopulation brigades are now eliminating all swine from the Southern Peninsula, beginning at the western tip and moving eastward toward Port-au-Prince.

Three hundred pigs have been purchased for use as sentinel animals to assure ASF virus no longer exists in cleared areas. One hundred fifty pigs are to be delivered the first week of April and another 150 are to arrive during the first week of May. Sentinels will be held in quarantine in Haiti for 3 to 4 weeks while they are tested to be sure they are free of hog cholera, African swine fever, brucellosis, leptospirosis, and pseudorabies. They will then be placed on premises where ASF swine were eliminated. Sentinel pigs will also be placed in all swine marketing facilities in the cleared zones.
(Dr. J. A. Downard, 301 436-5256.)

World Situation Update

While the first unpleasant surprise for the year 1983 in regard to exotic diseases was provided by foot-and-mouth disease in Denmark, attention has now shifted to **African swine fever (ASF).** After resisting eradication efforts in Sardinia for some time, the disease now appeared on two premises on the Italian mainland near Turin. At this time, there is only speculation as to how the disease got there and whether it will be possible to contain it there. Otherwise, the disease is still being reported in Spain and Portugal and some old endemic areas in Africa.

Eradication efforts in Haiti should be completed late this summer. (See Haiti ASF program update in this issue of FAD Report.)

Foot-and-mouth disease again was reported in many countries (Kenya, Mozambique, Malawi, Zambia, Nigeria, Libya, all countries in South America with the exception of Chile, Iran, Iraq, Burma, Hong Kong, India, Kuwait, Pakistan, Thailand, Turkey, USSR, East Germany, Spain, and Denmark). Infection in Denmark was found only on one premise. The USSR has denied any outbreaks occurring in its Baltic regions, stating that cattle in the area had not been vaccinated for some time, but were being vaccinated last fall to decrease the risk of infection.

Contagious bovine pleuropneumonia was reported in Angola, Kenya, Mali, France, and Portugal. No doubt there are connections between the cases in France and Portugal.

Rinderpest was reported in Egypt, Oman, Niger, Tanzania, and Mali. Problems with this disease have also surfaced in Syria, Lebanon, and Israel, areas where the present political situation appears to hamper successful countermeasures.
(Dr. H. J. Seyffert, 301 436-8285)

Suspected Foreign Animal Diseases

A total of 148 occurrences of unusual animal disease conditions was investigated by specially trained APHIS Foreign Animal Disease (FAD) diagnosticians during the period January 1 to March 30, 1983. Most of the investigations resulted from continued reports of vesicular disease in cattle and related surveys and tracing of exposed cattle that were moved from affected premises during the period in which virus could have been present. (Dr. A. A. Furr, 301 436-8091)

Embryo Importation Feasibility Investigated

Due to increased interest by the U.S. livestock industry in obtaining new germ plasm from India, Dr. E. C. Sharman and Dr. Harvey Kryder from Veterinary Services visited that country in January 1983 to assess the feasibility of importing either cattle or embryos from that part of the world. They were accompanied by several interested persons from Texas who have expressed a desire to import Indian cattle or embryos into the United States. Major sites visited during the trip included New Delhi, Ahmedabad, Rajkot, Hyderabad, and Ongole. Discussions were held with officials of the Government of India and the States of Gujurat and Andra Pradesh. Numerous cattle owners, animal husbandry specialists, and veterinarians were also contacted.

The Government of India presently prohibits the export of cattle since most of the better livestock has been depleted through previous shipments to other countries. There are no restrictions, however, on the export of semen or embryos. Artificial insemination is practiced widely throughout the country but embryo transfer is still undergoing development and is only conducted at one facility located near Bombay. Indian officials and cattle owners expressed interest in embryo transfer and for the most part were very receptive to the preliminary discussions concerning this matter.

Since India is affected by foot-and-mouth disease (FMD), rinderpest, contagious bovine pleuropneumonia, and numerous other exotic diseases, the importation of embryos from that country could be safely accomplished only through effective testing and quarantine procedures in the country of origin. Potential donors of semen and embryos would have to be screened by using a number of tests and then, if eligible, be isolated and maintained in strict quarantine until the embryos could be obtained through nonsurgical procedures. Due to the prevalence of FMD and rinderpest on the Indian mainland, an off-shore quarantine station would meet Veterinary Services requirements for complete isolation of the potential donors. In order to decrease the risk of having the donors exposed to diseases of concern, it is very likely that small calves would have to be selected, isolated, and raised by hand feeding until they can manage on their own. These calves would be tested at intervals prior to embryo collection to verify that disease exposure did not occur. This should substantially reduce the chance of using donors that were exposed to infection. While there are no off-shore quarantine stations at the present time in India, a number of islands at the mouth of the Krishna River in Andra Pradesh meet all the requirements for such a facility.

Embryos would be shipped either fresh or frozen to the Harry S. Truman Animal Import Center (HSTAIC) in Fleming Key, Florida. There they would be transferred to specially selected U.S. cattle. The cattle would remain in isolation for approximately 10 months during gestation and calving under close observation by U.S. Department of Agriculture (USDA) veterinarians. A series of tests would be performed to ensure no agent of exotic animal disease is present. Release of the cows and calves from HSTAIC into the United States would only be authorized after USDA officials are satisfied there is no risk to the U.S. livestock industry.

While it will take some time for the importation of embryos from India to become a reality, USDA officials are confident that the procedure is feasible and can be accomplished with minimum risk of disease introduction. The project offers great benefits both to the U.S. livestock industry and India. If successful, it would provide proof embryos can be transported internationally without transmitting animal diseases. (Dr. H. A. Kryder, 301 436-8530)

Philippine Scientific and Technical Exchange

A U.S. Department of Agriculture (USDA) delegation was sent to the Philippines, January 10-14, 1983, to identify possible areas for scientific and technical exchange. The activities of the delegation were coordinated by representatives of the Office of International Cooperation and Development (OICD) and included participants from the Foreign Agricultural Service, Agricultural Research Service, and Animal and Plant Health Inspection Service (APHIS). Project proposals of interest to animal health were a cooperative study of the interactions of Newcastle disease with wild psittacine birds and domestic poultry populations, and scientific and technical exchange on biologics testing and laboratory design. The exchanges will include visits by Philippine scientists to the United States to study biologics safety, potency and efficacy testing, and a

visit by a United States scientist to the Philippines to consult on the design of a new biologics production and quality control laboratory.

With a high priority for foot-and-mouth disease (FMD) eradication by the Philippine Government, current efforts on the testing of all imported FMD vaccines for safety, potency, and efficacy are emphasized. In addition, the study on Newcastle disease in psittacine birds is important to U.S. disease eradication programs and the furtherance of our understanding of the disease process. (Dr. W. W. Buisch, 301 436-8073)

Disease Eradication Capabilities Tested

USDA, APHIS, Veterinary Services held a test exercise, code-named Omega 83, starting March 14, 1983, lasting for 5 days to check the Department's capability to stop the invasion of a foreign animal disease in the United States.

Two regional task forces were activated. One in western Ohio at Dayton, and a second in the southwest corner of Iowa operating out of Omaha, Nebraska.

The test simulated the introduction of a highly fatal disease of swine, code named "Rien" which in French means "nothing." The theoretical introduction of the disease "Rien" was from two sources. One source was Iberian hams and sausages mailed from Spain by U.S. tourists to friends in Iowa, Missouri, Nebraska, and Kansas. Ultimately, some of the scraps were fed to hogs resulting in the initial introduction of "Rien" in Iowa. A second source was an unprocessed wart hog trophy illegally shipped from Africa to the hunter's home in Virginia. The initial outbreak in Ohio was traced to the purchase of Virginia hogs that had been exposed to the virus introduced with the wart hog trophy.

The field task forces and National Emergency Field Operations headquarters were fully mobilized with a total of 121 people. The disease eradication organization had a full complement of veterinarians, animal health technicians, military and wildlife specialists, administrators, and support personnel. Observers were present from Australia, Canada, the livestock industry, and other interested groups. (Dr. A. A. Furr, 301 436-8061)

Advisory Committee Warns of FMD Threat

Vesicular stomatitis, currently in the Western United States, cannot be distinguished from the much more serious foot-and-mouth disease (FMD) and could "mask" an outbreak of the latter, according to the U.S. Department of Agriculture's Foreign Animal Disease Advisory Committee. At its February 16-17 meeting at the Veterinary Services Emergency Programs headquarters in Hyattsville, Maryland, committee members repeatedly voiced their fears that all cases of vesicular stomatitis were not being reported by livestock owners or practicing veterinarians. Under these circumstances, they stated, it would be a very simple matter for FMD to spread widely in our livestock and wildlife populations before being detected. The two diseases can be distinguished only by laboratory tests.

The committee asked USDA to do everything in its power to bring the dangers of vesicular stomatitis to the attention of the public and to take any actions possible to learn more about this disease and how it can be controlled.

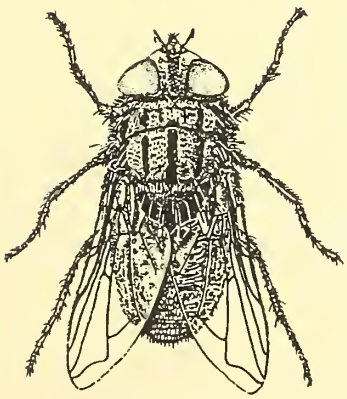
Another area of concern to the committee was the continuing flow of requests to allow the importation of some meat products that might not be safe from an animal disease standpoint. The committee recommended that work continue on assessment of disease agents in animal products and urged that such work be at the expense of the exporting country instead of the U.S. taxpayer.

The advisory committee is made up of livestock and veterinary representatives. Its function is to advise the Secretary of Agriculture on the concerns and opinions of the livestock industry about actions needed to protect the United States from foreign animal and poultry diseases.

Committee members include: Dr. James Acree, Jacksonville, Florida; Dr. H. Neil Becker, Archer, Florida; Neal Black, South St. Paul, Minnesota; Merlyn E. Carlson, Lodge Pole, Nebraska; Dr. Walter Cottingham, Kingstree, South Carolina; Bert Hawkins, Ontario, Oregon; Michelle C. Howard, Sacramento, California; Dr. Frank Hayes, Athens, Georgia; Dr. John F. Kluge, Ames, Iowa; Ralph Knobel, Fairbury, Nebraska; Clarence Miller, Shelbyville, Kentucky; Jack Rundquist, Butler, Illinois; Latimer Turner, Sarasota, Florida; and Thomas Weddle, Liberty, Kentucky. (APHIS News Center, 301 436-7716)

Focus on... Screwworm

Screwworms, the larvae or maggots of the screwworm fly (Cochliomyia hominivorax), attack all warmblooded animals including humans, wildlife, and pets. The worms feed on healthy flesh in open wounds, unlike blowfly maggots which usually feed only on dead or diseased tissue. Screwworms can seriously injure, maim, or kill infested animals, particularly if wounds are left untreated and become reinfested. Economic losses from death, crippling, weight losses, increased susceptibility to diseases, and labor costs to inspect and treat animals can be great.



The screwworm fly is about twice the size of the common housefly. It has orange-colored eyes and a bluish-green body with three dark stripes along the back. The center stripe is shorter than the other two. The fly is rarely seen except around animal wounds.

Screwworm, the common name of the parasite, comes from the shape of the larva which is tapered and has dark, concentric rings of spines, giving it the appearance of a woodscrew.

The female screwworm fly usually mates only once in her lifetime. This mating fertilizes all her eggs, which she lays in batches of up to 400 along the edges of open wounds. Within 12 to 24 hours, the eggs hatch into tiny larvae ("worms") which

burrow into the wound to feed. The larvae are difficult to detect in a wound at this stage, since only their posterior ends protrude. With two hooks, the larvae tear at the wound and feed on the fluid exudate.

As the worms feed, they increase the size of the original wound. Once infested, the wound becomes more attractive to other female screwworm flies. These multiple infestations can cause death in the host animals if left untreated. Grown steers have been killed in 10 days.

The worms grow to about one-half inch in length after 5 to 7 days of feeding. When fully developed, they drop from the wound, burrow into the soil, and form brown, tough-shelled puparia (cocoons) which protect the developing flies. The screwworm fly emerges from the pupal casing after about a week in warm weather or as long as 65 days in cold weather. After 3 days it is ready to mate. The screwworm life cycle averages about 3 weeks.

Weather is an important factor in the location, spread, and severity of screwworm infestations. Warm, humid weather encourages screwworm development and activity while extreme high or low temperatures and drought tend to limit populations and movement.

As screwworms cannot survive extreme cold, their overwintering areas (areas where the fly can survive year round) are normally confined to tropical and subtropical regions. A mild, moist winter usually contributes to greater spread and more danger of reinfestation.

Geographic Distribution

There are two genuses of flies known in the world whose larval stage develops in wounds of living warmblooded animals. One, Chrysomyia bezziana, is known as the "Old World" screwworm and is located throughout southern Asia and Africa. The other, Cochliomyia hominivorax (Coquerel), is confined to tropical and subtropical regions of the Western Hemisphere. It is the subject of this article.

History of Screwworm Eradication

Screwworm infestations were reported in the Western States as early as 1825. Destruction caused by the pest increased over the years to the point where livestock production became unprofitable in some areas. Home remedies for treating infestations were ineffective, and by the turn of the century ranchers were appealing to the Government for help.

The USDA started research on screwworms in 1913. Insect toxicologists and entomologists at the research station concentrated on measures to protect wounds against screwworms. Among the various toxic chemicals tested, No. 62, diphenylamine, proved the most effective as a wound dressing. The preparation was further stabilized with the addition of lampblack and became the well-known Smear 62. For years, this was the only relief from screwworm infestations.

Even with an effective wound dressing, screwworm infestations continued. Constant vigilance was needed to protect livestock.

The trapping of immense numbers of blowflies over several years brought no appreciable reduction in the number of infestations. In 1933, extensive research on the screwworm life cycle was undertaken.

In 1937, Dr. E. F. Knipling, while observing the behavior of flies held in cages, noted that the flies in cages began mating when they were 2 days old. After the flies were 4 to 5 days old, mating seldom occurred, although males continued to pursue females until most of the flies died after 2 weeks. Generally, the females accepted the males only one time even though continually harassed.

In 1938, during conversations with his associates, Drs. R. C. Bushland and A. W. Lindquist, Dr. Knipling noted his observation that the females seemed to mate only once while the males were promiscuous. He suggested that if some way could be found to sterilize males, it might be feasible to rear, sterilize, and distribute them throughout infested areas. Natural reproduction would be stopped if eggs were not produced or if those produced were not fertile. It should be possible to overwhelm the native males with sterile males and eventually develop a situation where fertile matings would not occur.

An intensive search was launched, therefore, to find an effective, economical means of sterilizing large numbers of male screwworm flies. It was found that screwworm pupae, just before emerging as flies, could be sterilized by x-rays. However, it was not until radioactive sterility was developed that an effective method was devised to sterilize large numbers of flies in a production system.

Southeast Eradication Program

To test the "sterile male technique" theory, USDA scientists sought an infested area isolated by natural barriers from migrating wild flies to eliminate the problem of reinfestation. In 1954 the Dutch West Indies island of Curacao, 50 miles off the northeastern coast of South America, was selected for a screwworm eradication experiment. Sterilized pupae were packaged in small paper bags in Orlando, Florida, and shipped by air freight to Curacao where the flies emerged. The paper bags, each containing 100 flies, were opened and scattered from a small airplane that flew twice weekly over the island. The number of infestations dropped steadily, and after 4 months, no egg masses or infestations were reported. Curacao, the first screwworm eradication success, remained screwworm-free for more than 20 years but later suffered a reinvasion of screwworms as a result of moving infested livestock to the island. USDA, cooperating with the Government of Curacao, eradicated screwworms again during 1977.

The Curacao experiment captured the interest of southeastern livestock producers. Until 1933, the Southeastern States had been free of screwworm. The movement of infested cattle from the Southwest into southern Georgia enabled screwworms to spread into Florida, where they became established and survived year round.

In 1957, preliminary tests with sterile flies in Florida showed promising results. The Florida legislature and livestock industry shared the cost of a 2-year eradication program conducted with the USDA. The effort was further supported by Georgia, South Carolina, Alabama, and Mississippi in a regionwide cooperative program authorized by Congress. The eradication effort began in 1958, and by the end of 1959 the Southeast was free of screwworms. The 2-year campaign cost about $11 million whereas screwworms had caused an estimated $20 million annual loss prior to the program.

Southwest Eradication Program

Success of the screwworm eradication program in the Southeast led western ranchers to request similar efforts in their region. Elimination of this destructive pest would relieve the region of losses estimated in excess of $100 million annually.

But screwworm eradication in the Southwest was clouded by several problems not present in the isolated southeastern region --screwworm overwintering areas in the Southwest were large and extended southward into Mexico, screwworm migrations across the 2,000-mile-wide U.S.-Mexico border presented a tremendous potential for reinfestation, and climatic conditions and livestock populations were entirely different from the Southeast situation.

A feasibility study conducted in the 1960's indicated that an eradication effort could be successful.

A southwestern eradication program began in February 1962. A sterile fly production plant was constructed by modifying a hangar at the former Moore Air Base in Mission, Texas. The new plant was designed to rear more than 150 million sterile flies per week.

The eradication program proved an outstanding success. By September 1963, screwworm infestations within the original five-State area (Arkansas, Louisiana, New Mexico, Texas, and Oklahoma) had been reduced by 99 percent, and with the cooperation of the Mexican Government, an artificial barrier zone had been established along the Rio Grande. The barrier extended from the Gulf of Mexico to the Pacific Ocean and varied in width from 300 to 400 miles. It extended 2,000 miles along the U.S.-Mexico border and included a portion of both countries.

Sterile flies were released in the United States in all areas where screwworm cases were occurring, along waterways, and other areas where the environment was particularly favorable for screwworm reproduction, and in other areas associated with past outbreaks or areas of high risk for future outbreaks. Sterile flies were released in the Mexican portion of the barrier zone in those areas from which screwworms were most likely to migrate into the United States. At times, as much as 90 percent of the sterile fly production was released in Mexico, and fly releases penetrated almost 400 miles into that country. Screwworm cases in the United States were in direct proportion to the cases that occurred in northern Mexico. It was essential, therefore, that screwworm populations be controlled as far south in Mexico

as possible to prevent their penetration into the United States.

By 1964 overwintering screwworm populations had been eradicated, and by the end of 1966 the last self-sustaining screwworm population in the United States had been eliminated in Arizona and California.

Joint Mexico-U.S. Screwworm Eradication Program

It had been recognized throughout the span of the southwestern program that the barrier zone alone could not prevent screwworms from reentering the United States causing damage to southwestern livestock. A disastrous 1972 season (95,625 cases identified) demonstrated clearly that a more effective barrier zone was needed. The United States and Mexico agreed jointly to eradicate screwworms from Mexico north and west of the narrow Isthmus of Tehuantepec in southern Mexico. An international agreement, which authorized a joint Mexico-U.S. Commission for the Eradication of Screwworms, was signed August 28, 1972.

A sterile fly production plant was constructed in Tuxtla Gutierrez, Chiapas, Mexico, and sterile fly production began in 1976 with weekly production set at 300 million per week. This total was combined with the 200 million produced at Mission, Texas, to begin the eradication effort.

By January 1981, the program had progressed southward far enough that it was no longer feasible to continue to produce and transport sterile flies from Mission. Therefore, the plant at Mission was closed. It remains in a state of readiness in case of a threat of screwworm reinvasion or serious disruption of production in Mexico.

In 1979, an attractant-bait-insecticide, Screwworm Adult Suppression System (SWASS), was designed for aerial distribution as an aid to the sterile fly technique. This also helped to reduce fly populations down to low levels where sterile flies would be more effective.

At this time, screwworms have been eradicated from four States in northern Mexico and controlled in approximately one-half of the country. Barring any unforeseen problems, eradication to the Isthmus is scheduled by the end of 1984 with the barrier established during 1985.

The Future

The Inter-American Institute for Cooperation on Agriculture (IICA) is coordinating feasibility and financial studies on extending the program through Central America and Panama and has shown considerable interest in sponsoring an expansion if it seems feasible. No decisions have been made on the USDA's involvement if the program is expanded. It is hoped that eradication can be achieved throughout the Central American countries and Panama. A barrier in Panama will be more dependable and less expensive than one in southern Mexico. (Dr. F. E. Smith, 301 436-8233)

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Errata

In page one of the March 1983 issue (11-1), the twelfth line of the table showing investigation results should begin with the word "Missouri", instead of "Montana".

In page 15 of the March issue, the third sentence should be, "Pastured cattle should be tested about 3 months after the end of the pasture season. If tested earlier, they should be tested again at least 3 months after the end of the pasture season."

ADDRESS CHANGE

Send address change 30 days before moving. If possible, include mailing label from latest issue, to:

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