13Th. CONFERENCE OF THE OIE REGIONAL COMMISSION FOR THE AMERICAS

CONCEPT NOTE

STRATEGIES FOR PRESERVING THE NEW WORLD SCREWWORM (NWS) FREE STATUS OF ERADICATED AREAS IN NORTH AND CENTRAL AMERICA

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Havana, Cuba, 26-29 March 1996

CONCEPT NOTE

STRATEGIES FOR PRESERVING THE NEW WORLD SCREWWORM (NWS) FREE STATUS OF ERADICATED AREAS IN NORTH AND CENTRAL AMERICA

FAO, Animal Production and Health Division

This Concept Note briefly outlines alternative strategies which will reduce the risk of the reinvasion of NWS into the recently eradicated areas covering 12 million Km² on the Americas mainland and also guard against its introduction to the 17 NWS free countries and territories in the Caribbean. It will demand the coordinated actions of all infested & free countries as well as the institutions concerned with the control/eradication of the disease in the region. Proposals are present how the experience and the resources accumulated by the Central and North American governments may be trasfered to Caribbean infested countries, at minimum costs and maximum efficiency, once eradication is achieved in Central America (CA). The eradication NWS from 4 of the 5 affected Caribbean countries is recommended in order to promote sustainable livestock agriculture and the promotion of free trade activities in North, Central America and the Caribbean Regions.

BACKGROUND

1. The main objectives of the public sector Veterinary Services (VS) in North and Central America (N&CA) are to support the production of food and crops and to promote human wellbeing through the control of zoonoses. One of the major tasks therefore is the control of major epizootic diseases.

2. A notable responsibility of VS is to protect the national agricultural industry from importation of diseases and pests. The economies of Mexico, Belize, Guatemala, El Salvador, Honduras, Costa Rica and Panama are dominated by the agricultural sector which contributes an average of 17 percent to their GNP and provides up to 30 percent of the national employment opportunities. Livestock, particularly ruminants, are an important component of this economy and their numbers progressively increase as expanding human populations demand more food. Agriculture is one of the main industries in U.S.A. and within this livestock production is the largest component. Based on cashed receipts, the livestock sector accounts for 55 percent of the total value of agriculture in U.S.A., not including the 40 percent of the plant sector dedicated to the production of animal feeds. Animals and their products are the leading agricultural commodities in 34 out of 50 states. The above seven mentioned countries constitute a surface area of 12 million square kilometres, have collectively 281 million livestock and support 365 million people.

3. NWS myiasis is a parasitic disease affecting both humans and animals. It is caused by the larvae of the fly ***Cochliomyia hominivorax*** which infests wounds in warm blooded animals. The life cycle, is about 21 days. The female, which mates only once, lays one or more batches of up to 300 eggs at the edge of any wound or skin abrasion.

Myiasis is arguably one of the major diseases which profoundly affects livestock. The magnitude of the problem dictates that its control is a prerequisite to the maintenance of viable livestock industries in the Americas.

4. By January 1996, NWS had been eradicated from all N&CA countries, with the exception of Costa Rica, Panama and Nicaragua, using environmentally friendly technology known as the Sterile Insect Technique (SIT). This involves the weekly aerial release of sterilised, laboratory reared flies over infested areas. Mating between wild females and sterile males produce no offspring thus interrupting the life cycle and progressively reducing the wild population to the point of elimination.

5. Eradication of NWS from N&CA is one of the biggest achievements of the animal health and livestock sectors, producing savings worth million dollars to large and small scale producers, consumers and taxpayers. The Cost/Benefit (C-B) ratios of these eradication programmes have been calculated at 1:4 for Mexico and 1:10 in USA. In 1988, the screwworm invaded North Africa and a eradication programme was implemented by FAO which achieved its objective by 1992 at a C-B ratio of 1:50.

6. The threat of reinvasion of NWS increases in proportion to the area eradicated due to the risk posed by the movement of pets, humans and the international trade in animals.

7. Examples of NWS outbreaks both real and potential, caused by such animal movements are as follows: 1982 a dog from Brazil to France; 1987 a dog from Honduras to U.S.A.; 1988 sheep from Latin America to Libya; 1989 a man from Panama to U.S.A.; 1990 bovines from Panama to Mexico; 1992 bovines from CA to Mexico; 1992 a woman from Brazil to New Zealand & Australia and in 1994 bovines from CA to Mexico. The costs of containment varied; for example, the Libyan campaign cost US$ 75.0 million and Mexico's largest outbreak cost US$ 8.0 million.

8. The economic crisies affecting Mexico, Central America (CA) and the Caribbean Countries (CC), has forced a substantial reduction in government services, including the VS, and has increased concern over a similar reduction in important animal health activities such as quarantine inspection and the impact this may have on NWS eradication operations.

9. Examples of recent failures to protect against NWS reinvasion in eradicated territories where it has been eradicated are as follows:

*In 1966, the U.S.A. was declared NWS-free and protected from reinvasion by a biological barrier, using by sterile flies, along 2000 miles of the Mexico-US border. In 1972, a failure in the barrier occurred, due to intensive legal and illegal livestock trade between the two countries and 90,000 NWS cases were detected in U.S.A.

*In 1984 the Mexico-United States Commission for the Screwworm Eradication (MUSCSE) achieved eradication in Mexico up to the Isthmus of Tehuantepec, and established a barrier in the narrowest part of country. In 1985, several outbreaks occurred in the central and northern territories, despite the implementation and autonomous

operation of a good quarantine network. This was mainly due to the constant movement of animals from the remaining infested areas in the southeast of the country.

10. By 1998, the Central American Governments and the MUSCSE expect to achieve eradication in CA and to establish of a sterile fly barrier, using 50 million flies per week, over the Darien Gap in Panama, which will them protect these territories from future infestations.

STERILE FLY PRODUCTION

11. The NWS campaign's demand for sterile insects varies and will be determined by the various local epidemiological situations. Based on the future needs of the Panama barrier, it is planned to build a new NWS production plant in Panama with a maximum production capacity of 200 Million Flies per Week (MF/W). Construction will take 3 years and the cost is estimated at US$100.0 million. The advantage of this new plant will be to reduce operational costs of transportation and the possibility of fertile flies escaping from the plant into the zones where NWS has been eradicated. However, funding problems are being faced for the construction of this new facility.

12. The factory at Tuxtla Gutierrez, Chiapas, Mexico, is unique in having a production capacity of 500 million insects per week. Actual production is 123 (MF/W), of which 120 million are sent to Nicaragua and 3 million are released around the factory forming a protective grid in case of accidental escape of fertile material. Once the Darien Gap barrier becomes operational the Mexican plant will only operate at 10 % of total capacity.

THE PROTECTION OF NWS-FREE TERRITORIES IN NORTH AND CENTRAL AMERICA

13. The aims of the Animal Production and Health Division (AGA) of FAO focus on the development of sustainable animal agriculture and food security of member countries, based on this, one of its work programme priorities is the EMergency PREvention System for Transboundary Animal Diseases (EMPRES), which involves activities to develop early warning, early reaction systems as well as enabling research into major animal diseases as the NWS.

14. The new Panama barrier will contribute to the partial protection of the non-infested N&CA countries. However, the Caribbean will remain infested thus presenting a high risk to the newly eradicated territories and to the non-infested countries in the Caribbean basin. The infested Caribbean countries are: Cuba, Dominican Republic, Haiti and Jamaica; as well as Trinidad and Tobago which present less risk to N&CA. Collectively the above countries constitute a surface area of 202,823 Km², with 17.3 million livestock and a human population of 26 millions.

15. The natural Screwworm-free countries and territories in the Caribbean are: Antigua & Barbuda, Aruba, Bahamas, Barbados, Cayman Islands, Dominica, Dominican Republic, Grenada, Guadelupe, Martinique, Montserrat, Netherlands Antilles, Saint Kitts & Nevis, Saint Lucia, Saint Vincent & Grenadines, Turks & Caicos Islands, British Virgin

Islands. The territories freed by eradication are: British Virgin Islands, Curacao, Puerto Rico and the U.S. Virgin Islands. These represents a total area of 32,791 Km², with 2.2 million animals and a human population of 5 million.

16. If the financial and human investment made in N&CA to eradicate the NWS warrants better guarantees, then the eradication of the caribbean source must be taken into immediate consideration.

NWS ERADICATION FROM THE CARIBBEAN

17. The main objective of eradicating NWS from the Caribbean Region will be the promotion of sustainable agriculture development and food security, though the elimination of NWS and the protection of NWS-free countries from reinvasion.

18. The Ministries of Agriculture of Cuba, Dominican Republic, Jamaica and Haiti, with assistance from FAO plan, during 1996 and 1997, to carry-out national studies on the NWS including its geographical distribution, seasonal abundance, economic impact and on economically improved methods to control the disease. (Table No.1).

19. Following these preliminary studies in the Caribbean, a multi-disciplinary mission should then prepare a project proposal for the regional eradication of NWS, to be submitted to potential donors for funding.

20. The purpose of the present FAO proposal is to coordinate the efforts being made by the countries involved in the NWS eradication programmes on mainland America, with those of other Screwworm affected countries in order to eliminate the disease and to protect the NWS-free countries in the Caribbean Region. By redirecting existing resources and experience from CA, once it has achieved eradication, to the island countries maximum efficiency will be maintained at minimun cost.

21. The following assumptions are made in drafting of proposals for extending the present activities to the Caribbean:

- That adequate funds will be available as required;
- That adequate sterile insects of desired quality will be available from the Mexican or Panamanian plants;
- That the governments involved will fully support the NWS eradication campaign and that there will no changes in their policy;
- That the infested areas in the Caribbean will be treated once the current operations in C.A. have achieved their objectives;

- ! That all NWS-Free countries will maintain strong inspection and quarantine services to prevent the introduction of infested animals from other endemic areas.

22. Trinidad and Tobago are not included in this proposal due to their proximity to the endemic countries of South America, and the associated real risk of reinvasion. However, once control/eradication activities are underway in the coastal areas of Venezuela, they should then be given priority consideration.

23. The estimated number of sterile insects required per week based on releasing 3000 sterile flies/square mile, and using the Chilled Fly System (CFS) as proved in the CA campaigns is as follows: Jamaica 15, Haiti 35, Dominican Republic 60 and Cuba 130, a total of 240 M/W. However, it will not be necessary to use this amount simultaneously as is the case in some mainland programmes.

24. As soon as eradication has been completed in CA (including installation of the Darien Gap barrier) estimated at September 1998, and the funding for the Caribbean programme has been assured, the following actions can be taken:

- ' Commence SIT in Jamaica and continue for 21 months up to June 2000, the time estimated to achieve eradication

- ' From January 1999 SIT can then commence in Haiti and continue for 21 months up to September 2000 in order to achieve the eradication

- ' At the same time, in April 1999, sterile fly dispersal can be initiated in the Dominican Republic where it will need to continue for 24 months until April 2001 in order to achieve eradication

- ' Regarding Cuba, SIT may be initiated in October 2000 and continued for 24 months until NWS eliminated

In Cuba, 203 M/W will be needed from July 2000 to June 2002. The actual time for NWS extermination in each of the islands may be shorter, than that estimated.(Table No.2).

25. In preparing the above estimates on sterile flies requirements, the contribution of the Tuxtla Gutierrez plant has been taken into account based on the assumption that it will maintain its functions up to the year 2002, with a constant production of 123 M/W from January 1996 to June 2000 and, will slightly increase production to 203 M/W from July 2000 to June 2002, followed by a reduction to 53 M/W (50 M/W Panama barrier, 3 M/W Mexican plant). This expectation will remain valid even when the Panama plant becomes operational and gives support to the Caribbean programme at the time that the maximum production of 203 M/W is needed (Table No.2).

26. The estimated costs of various component activities, as a percentage of the total budget for eradication from any particular country, are estimated as follows: feeding and

production 23 %, pupa transport 8 %, aerial dispersal 32 %, climate controlled distribution centre 14 % and field operations 23 %.

27. Ideally the eradication project should have an early assurance that the funds required are available to allow completion. However, particularly in the case of the Caribbean, operations can be programmed on an island-by-island basis, as they have the advantage of being isolated and presenting less risk of the natural migration of NWS flies. Exceptions to this are the Dominican Republic and Haiti.

28. Once the Caribbean countries have been cleared of NWS the authorities should introduce rigorous actions to prevent reinvasion.

FIGURES:

Table No.1 Summary Plan of Action

Table No.2 Weekly sterile insects required by country for NWS eradication in the Caribbean