REPORT OF THE COMMITTEE ON PARASITIC DISEASES

Chair: Joseph L. Corn, Athens, GA
Vice Chair: J. Mathews Pound, Kerrville, TX

Bob H. Bokma, MD; Corrie C. Brown, GA; A. A. Cuthbertson, NV; Dee B. Ellis, TX; John E. George, TX; Chester A. Gipson, MD; Larry L. Hawkins, MO; Bob R. Hillman, TX; Thomas J. Holt, FL; Lee C. Jan, TX; Ralph C. Knowles, FL; Ulysses J. Lane, NC; Linda L. Logan, TX; Terry F. McElwain, WA; Daniel G. Mead, GA; Andrea Mikolon, CA; Ernie A. Morales, TX; Don L. Notter, KY; James E. Novy, TX; Jack L. Schlater, IA; Robert C. Stout, KY; Lee Ann Thomas, MD; Paul O. Ugstad, TX; Sherrilyn H. Wainwright, CO; Kenneth Waldrup, TX; James A. Watson, MS; John B. Welch, TX; David W. Winters, TX.

The Committee met on October 28, 2008 at the Sheraton Greensboro Hotel, Greensboro, North Carolina, from 8:00 a.m. to 12:00 p.m. There were 15 members and 18 guests present.

Dr. Mat Pound, Knipling-Bushland U.S. Livestock Insects Research Laboratory, Agriculture Research Service (ARS), gave an update on wild ungulates and the Cattle Fever Tick Eradication Program. There is strong evidence that white-tailed deer and other wild ungulates are compromising the Cattle Fever Tick Eradication Program. It is further compromised by the continual decrease in numbers of cattle being raised in South Texas counties which function as sentinels for the discovery of fever tick outbreaks and as easily treatable hosts to aid re-eradication of the ticks.

During the last few decades there has been an increase in the incidence of fever tick infestations being discovered on white-tailed deer. More recently, deer that have been captured and examined for ticks have shown an alarming increase in the proportion of deer that are heavily infested. This is strongly indicative of their increased role in maintaining and dispersing the ticks among premises, especially within counties such as Zapata and Starr which have relatively small pastures as compared with those in larger more northern counties. These smaller pastures permit deer to travel among several premises within their home ranges, thus dispersing ticks to cattle in multiple premises.

Several potential treatment technologies have been developed to aid the Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS) in alleviating the problem; however, funds and labor currently are insufficient to make optimal use of them. Having just completed FY2008 which had the highest number of fever tick infestations since the outbreaks of 1976, infestations that have occurred during the first four weeks of FY2009 indicate that infestations are continuing to rise, and perhaps this year will have an even greater number, perhaps the greatest since 1960.

Dr. Dee Ellis, Texas Animal Health Commission (TAHC), and Dr. Paul Ugstad, VS-APHIS gave an update on the Cattle Fever Tick Eradication Program. *Boophilus microplus*, the southern cattle tick, and *Boophilus annulatus*, the cattle tick, were first introduced into eastern Mexico on livestock brought to the new world by the Spanish colonists. *B. annulatus* was once the most important external parasite of cattle in the Southern States. These ticks are important because they transmit the protozoa, *Babesia bovis*, and *Babesia bigemina*, the causative agents of babesiosis, also known as Cattle Fever, Splenetic Fever, Spanish Fever, Texas Cattle Fever, and Murraine Fever. The clinical disease seen in cattle is due to the destruction of red blood cells which are parasitized by the protozoa, and the buildup in the host of the products of that cellular destruction. Anemia, pyrexia, splenomegaly, hemoglobinuria, icterus, and dyspnea are among the clinical signs. Morbidity in naïve cattle may exceed 90 percent.

In 1906, the national *Boophilus* tick campaign was initiated; the area infested encompassed parts of 14 southern states and a portion of southern California. The goal was eradication of ticks. Economic losses at that time were estimated to be in excess of $100 million each year. By 1943, the eradication campaign was declared complete, although subsequent outbreaks of *Boophilus* ticks occurred in Florida and Texas. In 1961, the U.S. was again declared free of *Boophilus* ticks and no further outbreaks have occurred outside of South Texas since that time.

The USDA Tick Force patrols the Fever Tick Quarantine Zone, apprehending stray cattle, horses and wildlife crossing the Rio Grande.

The number of infested premises in FY2008 was the highest since 1976, and the number in the permanent quarantine (systematic) zone was the highest recorded since the ticks were declared eradicated in 1961.

In 2007, three temporary preventive quarantine zones were established in response to incursions of fever ticks outside the permanent quarantine zone. Because this more than doubled the area under quarantine, a needs assessment was performed and a request for emergency funding was prepared indicating a need for $13.3 million over the next two years to eradicate these outbreaks. The program received $340,000 in contingency funds near the end of FY2007, and an allocation of $5.2 million in Commodity Credit Corporation (CCC) funding in March of 2008.

While the additional funding enabled us to provide additional manpower in the quarantine zones and in the northern temporary zone there has not been evidence of additional spread of fever ticks beyond adjacent premises, there were several premises disclosed in Starr and Zapata counties well outside the previously established quarantine zone. In July of 2008, those zones were expanded and coalesced into one large temporary quarantine zone. We again formulated a funding request for $15.5 million to continue the efforts and to address the additional manpower, acaracide, and equipment needed to eradicate the incursions in the expanded quarantines.

If sufficient funding is made available, USDA and TAHC plan to institute scratch inspection and dipping of all livestock sold through seven South Texas markets. This will ensure buyers in Texas and surrounding States that the animals are free of fever ticks, as well as reduce the workload on the tick force because the infestations will be disclosed prior to animals moving. The tracing activities resulting from infestations found in the free area require valuable time which reduces the time spent on horseback river patrol, potentially allowing more infested Mexico-origin livestock and wildlife to continue to seed down the U.S. side.

Additionally, it is evident that the time-honored pasture vacation method of releasing quarantine is no longer effective in the current climate of increased wildlife populations capable of sustaining the fever ticks in the absence of cattle. Requiring producers to gather and treat cattle every 14 days for nine months is not a viable option economically, and on many premises is physically next to impossible.

The program desperately needs treatment options which are effective with less frequent application. TAHC and VS have engaged Natural Resources Conservation Service (NRCS) in proposing some measures which would assist producers in brush control, pasture rotation, and fencing which would help producers in eliminating the ticks.

The strategic plan which was formulated in 2005-2006 has not been funded. It is vital that the emergency funding, as well as funding for the strategic plan, be made available. Failure to provide the resources needed places the U.S. at risk for the fever tick to re-establish infestations throughout its natural range – 14 southern States and portions of Southern California.

Dr. Javier Rojas, Mexico-American Commission for the Eradication of the Screwworm gave an update on a demonstration project for screwworm control and groundwork for a future screwworm eradication program in Mercosur (Southern Common Market) countries:

According to the Global Framework for the Progressive Control of Trans Boundary Animal Diseases, a joint initiative of the United Nations Food and Agriculture Organization and the World Organization for Animal Health, livestock-farming generates nearly half of the agriculture sector's contribution to gross domestic product worldwide. Recent zoo sanitary emergencies in various countries (Great Britain, Asian countries) have revealed the livestock sector's vulnerability to the serious damages caused by disease epidemics and the need for effective services and practices in all areas of animal health. Based on 2000 statistics, the Food and Agriculture Organization estimates the annual economic impact of the New World screwworm fly (*Cochliomyia hominivorax*) on the countries covered by the proposed operation as follows: USD $210 million in Uruguay; USD $1.77 billion in Brazil; and USD $103 million in Paraguay. Losses are caused by productivity declines due to animal disease and death, destruction of hides and the labor and insecticide costs associated with ongoing inspections and treatment of vulnerable wounds. The primary mode of transmission of the screwworm fly from one country to another is through infected animals and the migration of fertile flies in border areas. The screwworm fly is also a serious public health problem that mainly affects the poorest, most vulnerable communities in the region. The general objective is to develop, over the next two years, a regional action plan for control and eradication of the screwworm fly and a regional screwworm control demonstration project that lays the groundwork for future eradication programs in the participating countries. The specific objectives are to:

- disseminate information on the screwworm problem to livestock farmers

- provide training in sampling techniques to technical staff at the three countries' Ministries of Agriculture
- identify myiasis-causing species
- obtain screwworm strains from the production facility run by the Mexican-American Commission for the Eradication of the Screwworm (COMEXA), in Mexico
- disseminate technology to eradicate the screwworm fly using the sterile insect technique.

Dr. Peter Merrell, VS-APHIS, provided an update on heartwater vectors and reptile imports. Large numbers of reptiles are imported into the U.S. on an annual basis and present a risk for introduction of heartwater vector ticks. USDA is beginning to hold stakeholder meetings in order to develop plans to mitigate this risk. Dr. Linda Logan, International Services (IS), APHIS provided a report on non-tsetse transmitted trypanosomiasis.

Dr. Thomas J. Holt, Florida Department of Agriculture and Consumer Services, gave a report on the outbreak of equine piroplasmosis (EP) in Florida in 2008. In August 2008, a racing quarter horse was presented to a Florida veterinary clinic with depression, fever, edema, and hematuria. Blood smears were submitted to the University of Florida, College of Veterinary Medicine, and EP, *Theileria equi*, was diagnosed and reported to State animal health officials. This diagnosis was confirmed by competitive enzyme-linked immunoabsorbent assay (cELISA), complement fixation (CF), immunofluorescence assay (IFA), and polymerase chain reaction (PCR) testing at the National Veterinary Services Laboratories (NVSL). Testing of 25 horses on the index premises revealed four additional positive horses. Quarantines were placed on adjacent and traced premises with possible exposure and testing carried out on all associated horses. Surveillance for ticks was initiated immediately on positive premises via horse inspections, ticks drags, and CO_2 traps. Most significantly, live animal trapping and tick collection carried out by Southeastern Cooperative Wildlife Disease Study (SCWDS) personnel, who routinely carry out surveillance in Florida for exotic tick species, was initiated to target surveillance on positive premises.

Twenty-five quarantines in all were issued, with a finding of seven positive premises with 19 positive horses. Owners of six of the positive premises elected to euthanize their positive animals and have followed a protocol for quarantine release that requires a 60-day negative retest of all exposed horses and negative tick surveillance (no competent vector, negative EP testing by PCR). One hundred thirty ticks were collected with 82 ticks (*Amblyomma maculatum*, Ixodes) considered non-competent vectors for *T. equi*. Forty-eight ticks were identified as *Dermacentor variabilis*, a tick shown experimentally to be a possible, but not effective, vector. All *D. variabilis* ticks were tested by PCR and one collected from a raccoon tested positive. Additional work is being done to elucidate this finding, as there are raccoon *Babesia* species that may have caused this positive test result.

There is strong evidence to point to iatrogenic spread of this disease among the affected horses. All of the positive horses are quarter horses used in unsanctioned racing events. These animals are for the most part treated by owners, trainers, and unlicensed animal health providers and there is a common practice of using shared needles, dental equipment, and blood packing, a practice of administering packed red blood cells to horses just prior to racing.

Epidemiological tracing has shown positive horse movement between all seven positive premises with at least two positive horses entering Florida from Mexico in 2004-2005. Florida has not had a reported case of EP for more than 20 years and it is believed that entry of this disease occurred with limited mechanical spread among an equine population not monitored by health professionals. This outbreak has highlighted concerns that this disease is entering the United States from the illegal movement of horses and the treatment of positive horses prior to import to mask infection.

Dr. Joseph L. Corn, Southeastern Cooperative Wildlife Disease Study (SCWDS), provided an update on wildlife surveillance associated with the current cases of equine piroplasmosis in Florida. SCWDS is assisting the Florida Department of Agriculture and Consumer Services with surveillance for wildlife and ticks at premises associated with the current cases of equine piroplasmosis in Florida through a Cooperative Agreement for Arthropod Surveillance with USDA-APHIS-VS. Surveys to determine the presence of wildlife and to collect ticks from wildlife are being conducted at all sites where horses positive for equine piroplasmosis have been found and on farms adjacent to these premises. Due to the small size of most of the premises involved, and the limited wildlife habitat present at most of these premises, wildlife trapping success has not been high. Trapping has been conducted at 11 premises and a total of 71 rodents,

opossums and raccoons have been captured and examined. Ticks collected thus far from wildlife have been *Dermacentor variabilis* and *Ixodes scapularis*. All ticks collected are being submitted to the National Veterinary Services Laboratories for identification and testing.

Dr. Sylvie Ahoussou, Centre International de Recherche en Agriculture pour le Développement, Guadeloupe, France, gave the update on *Amblyomma variegatum* programs in the Caribbean. A summary of this presentation is included at the end of this report.

Committee Business:

The Committee passed one resolution on Tropical Bont Tick, which was forwarded to the Committee on Nominations and Resolutions.

ANALYSIS OF AMBLYOMMA SURVEILLANCE DATA AND TICK POPULATION DYNAMICS IN THE CARIBBEAN: PERSPECTIVES FOR FUTURE CONTROL PROGRAMMES.

Dr. Sylvie Ahoussou,
Centre International de Recherche en Agriculture pour le Développement
Guadeloupe, France

Initially introduced in Guadeloupe and Antigua in the 18th Century, the tropical bont tick (TBT) *Amblyomma variegatum* spread to 17 islands in the Caribbean region mostly since the 1970's, probably in association with cattle egrets. This tick is the principal vector of heartwater and is also associated with dermatophilosis, which have resulted in major losses in animal production and mortality, mainly in cattle. The tick is endemic in this region and constitutes a threat to the American mainland. From 1995 to 2007, the Caribbean *Amblyomma* Programme (CAP) supported treatment and surveillance activities in 11 islands of the Eastern Caribbean with an initial aim at tick eradication. This objective was partially achieved: in some islands the tick was eliminated, while in others tick hotspots persisted.

Where adequate surveillance data were collected between 1995 and 2006, and entered in the regional database, TickINFO, an in-depth analysis was carried out. The surveillance level (numbers of animals examined and farms visited per quarter), and animal and farm infestation rates (by host species, year, quarter, parish) were analysed from four islands (Nevis, St Kitts, St Lucia, Barbados) with R software.

The study pointed out 1) an adequate level of surveillance (for detection of 1 percent prevalence) in Nevis, St Lucia, and Barbados. In St Kitts, inadequate surveillance in some quarters could have contributed to the late detection of the recent reinvasion and spread; 2) a decrease in tick populations following treatment programmes; 3) adult tick seasonality on livestock during the 3rd quarter of the year in Nevis and St Kitts; and 4) a higher infestation level in cattle than in small ruminants. The results assist in predicting possible consequences of the termination of the programme on the expansion of TBT populations, and can help providing recommendations for future national control and surveillance activities.

Geographical information analysis will be used to clarify risk factors related to tick ecology. Tick population modelling will be performed for the Caribbean region and validated against the results of this analysis.