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United States
Department of
Agriculture

Animal and
Plant Health
Inspection
Service

Veterinary
Services

APHIS 91-39

National Tick Surveillance Program

Calendar Year 1984

U.S. DEPARTMENT OF AGRICULTURE
CURRENT SERIAL RECORDS

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National Tick Surveillance Program Calendar Year 1984

During calendar year 1984, the collection and submission of ticks from native and imported animals plus plant and animal material was 29 percent less than in 1983. There were 7,213 collections in 1984, 10,207 in 1983, 9,086 in 1982, 9,381 in 1981, 7,763 in 1980, and 11,553 in 1979.

Interception of a Heartwater Vector in Texas

In June 1984, *Amblyomma hebraeum*, a vector of heartwater (*Cowdria ruminantium*), was collected from a female black rhinoceros on a cattle ranch near Linn, Texas. This rhino was one of three rhinos on the ranch. These three rhinos were part of a consignment of five rhinos imported into the United States from South Africa in March 1984. The other two rhinos in the consignment were shipped to an exotic game ranch near Glen Rose, Texas. The black rhinoceroses, an endangered species, were brought to the United States as part of an experimental breeding program.

The ticks were collected by Dr. Sherri L. Huntress, a veterinarian from the Gladys Porter Zoo in Brownsville, Texas. One of the female rhinos died unexpectedly and during the postmortem examination, Dr. Huntress noticed several "unusual" ticks which were collected and forwarded to the National Veterinary Services Laboratories, Ames, Iowa, where they were identified as male specimens of *A. hebraeum*, the South African bont tick.

Because of possible exposure of cattle to the tick-infested rhino, a State quarantine was placed on the ranch near Linn, Texas. Since there were no cattle on the exotic game ranch near Glen Rose, this ranch was not quarantined. A team of entomologists from Veterinary Services was sent to Texas to inspect the rhinos for additional ticks and to conduct a tick survey on both ranches. The entomologists were assisted by experienced personnel from Veterinary Services Fever Tick Eradication Program, Laredo, Texas.

Examination of the rhinos by the entomologists and tick eradication specialists on the ranch near Linn revealed additional male specimens of *A. hebraeum* as well as native ticks (*Amblyomma cajennense*). No *A. hebraeum* were found on the rhinos at the Glen Rose ranch; however, another native species, *Amblyomma americanum*, was found on the two rhinos. Surveys of the pastures on both ranches were negative for *A. hebraeum*.

After examination, the rhinos on both ranches were thoroughly sprayed with 0.125 percent coumaphos. The pasture used by the rhinos at the ranch near Linn was sprayed with 0.25 percent chlorpyrifos. A followup investigation was conducted on both ranches a month after the first investigation and no further evidence of *A.*

hebraeum was found. In addition, wildlife and livestock on the ranch near Linn were periodically sampled throughout 1984 for ticks by Veterinary Services tick eradication specialists. No *A. hebraeum* were found on any of the animals examined.

The impact of the interception of *A. hebraeum* was minimized by three factors: 1) the results of the investigation indicated that only male *A. hebraeum* were transported from Africa; 2) rhinos are nonruminants and are therefore not susceptible to heartwater; and 3) the rhinos came from an area in South Africa reportedly free of heartwater.

There are two principal avenues by which foreign animal diseases may enter the United States: 1) importation of diseased animals or 2) importation of foreign animal disease vectors. These risks are greatly reduced when dealing with wild or domestic animals for which the U.S. Department of Agriculture has jurisdiction. However, rhinos and some other nonruminants are not presently regulated by the U.S. Department of Agriculture. Thus, rhinos, elephants, large cats, and various other classes of non-domesticated animals may presently enter the United States without being inspected for parasites or diseases. The increasing volume and rapidity of commerce via air transport have intensified the danger of the introduction and establishment of exotic vectors. This is particularly true with the recent trend towards placing zoological animals in "natural-type" environments that directly expose susceptible domestic livestock and native wildlife. Importers of zoological animals, State, and Federal regulatory personnel should be aware of this danger and take necessary precautions to prevent the introduction and establishment of exotic parasites and diseases.

Boophilus microplus in Puerto Rico

The cooperative eradication program between the U.S. Department of Agriculture and the Commonwealth of Puerto Rico Department of Agriculture to eliminate *B. microplus* gained momentum in 1984. The program continued the systematic treatment of infested herds from two headquarters, one on the eastern and the other on the western end of the island. The eastern headquarters is located at Juncos; the western headquarters is at Arecibo. During 1984 there were some 1,279 herds comprising over 42,000 animals under treatment and supervision by the Juncos station. There are 3,501 total premises in the Juncos quarantine area. The Arecibo quarantine area has 4,004 premises and during 1984 over 1,500 herds with more than 17,000 animals were under treatment.

The total tick eradication budget for 1984, which included funds from the USDA, APHIS; the Commonwealth; and

other USDA (Food and Nutrition Service), was \$11,622,150. This funding permitted the program to obtain the necessary vehicles, equipment, supplies, and personnel to actively pursue the eradication effort.

***Amblyomma variegatum* in Puerto Rico**

The tropical bont tick eradication effort continued to make progress in 1984. There were only seven laboratory-confirmed collections of *A. variegatum* for 1984. Six of the collections were from cattle and one was from a horse. Two collections were from Cabo Rojo, four were from Ponce, and a single collection was made on the island of Vieques.

The seven laboratory-confirmed collections in 1984 compared to 38 confirmed collections in 1983 and 50 in 1982. At the end of 1984 there were 46 premises under quarantine for exposure or infestation by *A. variegatum*.

***Boophilus* Tick Eradication in Texas**

The cattle fever tick situation continued to look good in 1984. Compared to recent years tick eradication activities were successful and relatively uneventful. There were no major outbreaks of *Boophilus* ticks in either the Tick Eradication Quarantine Area or the Free Area.

During 1984, 163 animals originating from Mexico were apprehended by Tick Eradication personnel along the Texas-Mexico border. This included 95 cattle and 68 horses of which 31 of the cattle and 15 of the horses were infested with *Boophilus* ticks.

The weather in 1984 was drier than normal. As a result, the Rio Grande River was low. Because of this, the stray livestock were allowed to cross the river into Texas. The smuggling of livestock continued as a problem with the threat of the introduction of *Boophilus* ticks being greater from smuggled Mexican livestock than from stray Mexican livestock.

Veterinary Services Committee on the Importation of Zoological Animals (VSCIZA)

A committee of experts were formed in 1984 to review the policies, regulations, and legal authorities involved in the importation of wild zoological animals into the United States. This committee also addressed the issue of ectoparasites entering the United States on nonregulated zoological animals.

Several incidents have occurred in recent years involving exotic ectoparasites found on unregulated animal species after importation into the United States. Animal health

authorities expressed concern that these unregulated wild zoological animals had the potential of introducing both foreign animal diseases and exotic vectors. These introduced parasites and diseases could become established in the United States and endanger domestic livestock as well as native wildlife.

The VSCIZA carefully reviewed the overall problem and issued an interim report on September 14, 1984, which made recommendations and options for handling the problem. In November 1984, the recommendations of the VSCIZA were submitted to four committees of the U.S. Animal Health Association (USAHA) at the annual meeting held in Fort Worth, Texas. The four committees of the USAHA which received the proposals included the Epizootic Attack Committee, Foreign Animal Disease Committee, Import-Export Committee, and Zoological Animals Committee. The USAHA issued an overall report in support of the recommendations of the VSCIZA. In early 1985 Veterinary Services established another committee to develop regulations to implement many of the VSCIZA recommendations.

Livestock Tick Research in 1984

The first full year of operation of the new USDA, ARS, Cattle Fever Tick Research Laboratory at Mission, Texas, produced progress on several research problems. The efficacy of a 50 percent flowable formulation of phosmet was tested by dipping *Boophilus annulatus*-infested cattle in a vat charged with concentrations of 0.03, 0.06, or 0.1 percent active ingredient (AI). The percent control obtained with each concentration was 97, 99, 99.7, respectively. In a related study a dipping vat was charged with 0.06 percent AI flowable phosmet to evaluate the stability and manageability of the material in a vat used frequently. The phosmet in the flowable formulation proved to be unstable and in approximately 2 months after the vat was charged, 98 percent of the acaricide had apparently been lost through degradation.

There is continuing concern about the possibility of finding acaricide-resistant ticks. Consequently, laboratory studies continue to evaluate the susceptibility to acaricides of cattle fever ticks from outbreaks detected in south Texas and Puerto Rico. Ticks from 10 locations along the Texas border with Mexico and two from Puerto Rico were evaluated and found to be completely susceptible.

Four experimental plots, each containing approximately 6 acres, have been fenced and infested with *B. microplus* for a small-scale field test of the sterile hybrid male *Boophilus* eradication technique. This summer, after determining that ticks are well established, hybrid larvae will be released periodically onto cattle in two of the plots while the other

two plots will serve as controls. An electrophoretic technique will be used to determine the proportion of hybrid and pure strain ticks in samples of ticks from cattle and thus will provide a means of monitoring progress toward the elimination of the pure strain *B. microplus* from the pastures. Dr. Larry Hilburn, the geneticist at the U.S. Livestock Insects Laboratory at Kerrville, and Dr. Paul Sattler, a research associate, are investigating the genetics of *Boophilus* ticks, including the hybrids from crosses between *B. Microplus* and *B. annulatus*, in an effort to discover a method for improving the sterile hybrid procedure.

After 5 years of full-time research in support of the tick eradication program in Puerto Rico, Dr. Glen Garris was reassigned to the Lone Star Tick Research Laboratory at Poteau, Oklahoma. However, Dr. Garris is still involved in cooperative research on the ecology and control of the tropical bont tick with French research workers on the island of Guadeloupe. Dr. Garris and other scientists in the Tick and Scabies Research Unit will make regular visits to Puerto Rico as part of continuing ARS efforts to provide research support for the eradication program. Most of the future research for the program in Puerto Rico will be conducted at the laboratory in Mission.

Tick Collections From All Hosts CY 1984

REPORT OF TICKS COLLECTED										PERIOD	HOST
										Calendar Year 1984	All Hosts
STATE	TOTAL	Cattle	Dogs	Horses & Hules	Zoo Animals & Hacc. Hosts	Native Wildlife	Animals & Products Offered for Entry				
TOTAL	7218	5741	234	760	107	263	113				
Alaboma	4	4									
Alaska											
Arizona	18	1	1				16				
Arkansas	6					6					
California	3	1	1			1					
Colorado	3		1	1		1					
Connecticut											
Delaware	1						1				
Florida	57	8	1	25	1	22					
Georgia	13	1				12					
Hawaii	1					1					
Idaho	3	1	1		1						
Illinois											
Indiana											
Iowa	4		4								
Kansas											
Kentucky	17					17					
Louisiana	12					11	1				
Maine	3				3						
Maryland											
Massachusetts											
Michigan											
Minnesota											
Mississippi	6	6									
Missouri											
Montana											
Nebraska											
Nevada											
New Hampshire											
New Jersey											
New Mexico	14					1	13				
New York	5				1		4				
North Carolina	7	7									
North Dakota											
Ohio	1						1				
Oklahoma	12	6				6					
Oregon											
Pennsylvania											
Rhode Island											
South Carolina	83	1	20	1	17	44					
South Dakota											
Tennessee	20	16			4						
Texas	3256	2329	200	457	53	140	77				
Utah											
Vermont											
Virginia	1		1								
Washington											
West Virginia											
Wisconsin											
Wyoming											
Puerto Rico	3668	3360	4	276	27	1					
Virgin Islands											

ANH FORM 5-55
MAY 1971

REPLACES ADE FORM 5-55, DEC 1964, WHICH IS OBSOLETE

USDA, APHIS, VS
NVSL, AMES, IOWA

Tick Collections From Animals and Products Offered for Entry CY 1984

REPORT OF TICKS COLLECTED														PERIOD	Calendar Year 1984		HOST	Animals and Products Offered for Entry	
STATE	TOTAL	AMBL YONMA AMERICANUM	AMBL YONMA CALIFORNENSE	AMBL YONMA ILLINOENSE	AMBL YONMA MACULATUM	AMBL YONMA SPP.	ARGAS PERSICUS	BOPHILUS ANULATUS	BOPHILUS MICROPLUS	BOPHILUS SPP.	DERMACENTOR ALBIPICUS	DERMACENTOR BREVIPALPIS	DERMACENTOR BREVIPALPIS	DERMACENTOR BREVIPALPIS	DERMACENTOR BREVIPALPIS	DERMACENTOR BREVIPALPIS	DERMACENTOR BREVIPALPIS	DERMACENTOR BREVIPALPIS	DERMACENTOR BREVIPALPIS
TOTAL	113	2	1	1	15	14	12	40	2	15	1	2	15	1	2	3	2	1	2
ARIZONA																			
Douglas	8								BBO										
Tucson	8												7BH ^d				1CD		
DELAWARE																			
Doover	1																		1BG ^x
LOUISIANA																			
New Orleans	1																	1PF	
NEW YORK																			
JFK	3															2FL ^o		1FL ^k	
Rock Tavern	1																		1AF ^e
NEW MEXICO																			
Columbus	13								10BO	2BO			1BO ^a						
OHIO																			
Columbus	1																	1HG	
TEXAS																			
Brownsville	5							3BO	2BO ^{**}										
Del Rio	13							1BO	2BO	1BO ^{**}	7BO				2BO ^{**}				
Eagle Pass	28							BBO	2BO	7BO ^{**}	7BO				3BO ^{**}				
El Paso	7							2DH			5BO				1BO ^{**}			1BO	
Laredo	24	2BO	1BO		1BO ^{**}		4BO	7BO	2BO ^{**}	2BO					1BO ^{**}	1BO ^{**}		1BO	

ANH FORM 5-55 MAY 1971

REPLACES ADE FORM 5-55, DEC 1964, WHICH IS OBSOLETE

Key to Hosts
AF African Grey Parrot
BG Baggage
BH Bighorn Sheep
BO Bovine
CD Coues Deer

DH Deer Hide
FL Flowers (cut)
HG Household Goods
PF Palm Fronds

Key to Species
a *Dermacentor parumapertus*
d *Dermacentor hunteri*
e *Haemaphysalis hooi*
k *Rhipicephalus kochi*
o *Ixodes pilosus*

x *Hyalomma excavatum*

** Nymphal stage

USOA, APHS, VS
NVSL, AMES, IOWA

Tick Collections From Cattle CY 1984

PERIOD	HOST
Calendar Year 1984	

ANH FORM 5-55 MAY 1971	REPLACES AGE FORM 5-55, DEC 1964, WHICH IS OBSOLETE		
Key to Species		**Nymphal Stage	USDA, APHIS, VS NVSL, AMES, IOWA
n <u>Amblyomma inornatum</u>			
v <u>Amblyomma variegatum</u>			

Tick Collections From Dogs CY 1984

REPORT OF TICKS COLLECTED														PERIOD	Calendar Year 1984														HOST																																																																																																																																																																																																																																																																																																																																																																																																								
STATE	TOTAL	AMBLIOMMA AMERICANUM	AMBLIOMMA CALIFORNENSE	AMBLIOMMA DELTAICOLA	AMBLIOMMA MACULATUM	AMBLIOMMA SPP.	ARGAS PERDUCUS	BORIPHILUS ANNULATUS	BORIPHILUS MICRODELUS	BORIPHILUS SPP.	DERMACENTOR ALBIPICUS	DERMACENTOR BREVIPALPIS	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	DERMACENTOR D. D. D.	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ANH FORM 5-55
MAY 1971

REPLACES ADE FORM 5-55, DEC 1964, WHICH IS OBSOLETE

Key to Species
n Amblyomma inornatum

*Oog had visited Portland, Oregon

**Nymphal stage

USDA, APHIS, VS
NVSL, AMES, IOWA

Tick Collections From Horses and Mules CY 1984

REPORT OF TICKS COLLECTED														PERIOD		HOST												
STATE	TOTAL	Calendar Year 1984										Horses and Mules																
		AMBL YOMMA AMERICANUM	AMBL YOMMA CAJENNENSE	AMBL YOMMA IMITATOR	AMBL YOMMA MACULATUM	AMBL YOMMA SPP.	ARGAS PERSCICUS	BOOPHILLUS ANNULATUS	BOOPHILLUS MICROPLUS	BOOPHILLUS SPP.	DERMACENTOR ALBIPUNCTUS	DERMACENTOR BREVIPALPIS	DERMACENTOR PENN. Q.	DERMACENTOR SUBSTIGILLATUS	DERMACENTOR VITREUS	HEMIPHYSALLUS LEPTORHINCHUS	IXODES PATRISTIS	IXODES COCKEII	IXODES PACIFICUS	IXODES SCAPULARIS	IXODES SPP.	ORNITHODOROS SPP.	OTIOBIUS MEGNI	RHINCEPHALUS SANBURNI	RHINCEPHALUS SPP.	MISCELLANEOUS SPP.		
TOTAL	760	24	23	1	67	2		6	30		54		9	260		268				3				1	12			
Alaboma																												
Alasko																												
Arizono																												
Arkansas																												
California																												
Colorado	1																						1					
Connecticut																												
Delaware																												
Florida	25				8								11		1					3					2			
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South Carolino	1														1													
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Texas	457	24	23	1	59	1 ⁿ		6	1		54		9	3		266									10			
Utah																												
Vermont																												
Virginio																												
Washington																												
West Virginio																												
Wisconsin																												
Wyoming																												
Puerto Rico	276					1 ^v			29					246														
Virgin Islands																												

ANH FORM 5-55
MAY 1971

Key to Species
n *Amblyomma inornatum*
v *Amblyomma variegatum*

REPLACES ADE FORM 5-55, DEC 1964, WHICH IS OBSOLETE

USDA, APHIS, VS
NVSL, AMES, IOWA

Tick Collections From Native Wildlife

REPORT OF TICKS COLLECTED														PERIOD	Calendar Year 1984			HOST																																																																																																																																																																																																																																																																																																																																																																																																																				
STATE	TOTAL	AMBL YOMIA AMERICANUM	AMBL YOMIA CALIFORNENSE	AMBL YOMIA MONTANA	AMBL YOMIA MACULATUM	AMBL YOMIA SPP.	ARGAS PERSCUS	BOPHILUS ANNULATUS	BOPHILUS MICROPLUS	BOPHILUS SPP.	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ANH FORM 5-55
MAY 1971

Key to Host
AD Axis Deer
AU Aoudad Sheep
BC Bobcat
BI Bison
BB Black Bear

CN Corsican Sheep
CO Coyote
CU Cougar
D Deer
E Elk

F Fox
J Javelina
LT Leopard Tortoise
OP Opossum
R Rabbit

RC Raccoon
RI Rock Iguana
SD Sambar Deer
T Wild Turkey

Key to Species
a Ixodes affinis
c Amblyomma cruciferum
f Dermacentor halli
m Amblyomma marmoratum
n Amblyomma inornatum
t Ixodes texanus

** Nymphal stage
*** Introduced species

USDA, APHIS, VS
NWSL, AMES, IOWA

Tick Collections From Zoo Animals and Miscellaneous Hosts CY 1984

HOST	
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Calendar Year 1984

Zoo Animals and
Miscellaneous Hosts[illegible]

ANH FORM 5-55
MAY 1971

REPLACES AOE FORM 5-55, DEC 1964, WHICH IS OBSOLETE

Key to Host

B. Barn

C. Cat

C Cat
G Goat

G Goat
H Human

Q Host.

Q Host 1

RN Rhinoceros

RM Rhesus Monkey

AM Jesus
S Sheep

S Sheep
X Inanimate

X	Human
Y	Swine

1 Swine

Key to Species

e *Rhinicephalus evertsi*

b. *Amblyomma hebraeum*.

В *Hyalomma impressum*

p Hyalomma impressum

****Nymphal stage**

*Found on recently imported trashy hides.

*Found on recently imported trophy hides

USDA, APHIS, VS

NVSL, AMES, IDWA
red trophy birds

led trophy hides