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DEPARTMENT OF AGRICULTURE
CLIMATE CONTROL RECORDS

APHIS 91-33
August 1977

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NATIONAL TICK ⁶²⁷⁶
SURVEILLANCE PROGRAM,
Calendar Year 1976 //

Animal and Plant Health Inspection Service
UNITED STATES DEPARTMENT OF AGRICULTURE

NATIONAL TICK SURVEILLANCE PROGRAM

Calendar Year 1976

During calendar year 1976, the collection and submission of ticks from native and imported animals and plant and animal material were approximately the same as in

1975. There were 4,528 collections in 1976, compared with 4,542 collections in 1975 and 11,042 in 1974.

THE TICK ERADICATION PROGRAM IN TEXAS

The *Boophilus* tick activity in south Texas reached a level not experienced in this area in over 30 years. A total of 264 *Boophilus* collections from Texas were confirmed by the Veterinary Services Laboratory in calendar year 1976. *Boophilus annulatus* infestations were recorded from Maverick, Dimmitt, Webb, Zapata, Starr, and Wilson Counties from cattle and whitetailed deer. The tropical cattle tick, *B. microplus*, was found on cattle and deer in LaSalle, Webb, Zapata, Starr, Hidalgo, Cameron, Willacy, Kleberg, Jim Wells, and Reeves Counties. The infestation in Reeves County, an area well beyond the range where *B. microplus* is known to survive, was found on cattle recently moved from an infested premise in south Texas. Two collections of immature *Boophilus*, unidentifiable as to species, were found on horses in Kleberg County. However, since *B. microplus* was the only species reported from Kleberg County, the collections from horses were probably *B. microplus*.

The *B. annulatus* infestations were primarily confined to the quarantined buffer zone along the Rio Grande separating Texas and Mexico. The *B. microplus* ticks were found in this same general area of south Texas as well as in several counties removed from the Rio Grande and adjacent to the Gulf of Mexico.

The infested premises are under State quarantine, and active surveillance and eradication procedures are being carried out by State and Federal tick eradication personnel. Present information indicates that the infestations are limited and confined to south Texas, but other Southern States are strongly urged to institute effective surveillance programs to detect these two ticks if they are accidentally introduced. Prior to 1906, *B. annulatus* was endemic in all or parts of 12 Southern States as well as California, and reportedly caused annual losses of from

\$40 to \$200 million. It has been estimated that in terms of today's purchasing power these losses could approach \$1 billion per year. *Boophilus annulatus* has the potential of reestablishing itself in all or parts of Texas, Oklahoma, California, Arkansas, Louisiana, Mississippi, Tennessee, Alabama, Florida, Georgia, South Carolina, North Carolina, and Virginia. This area supports some 30 million cattle worth an estimated \$5 billion.

The potential for the spread of *B. microplus* is not as great as that of *B. annulatus*. The tropical cattle tick, *B. microplus*, has never been established in the continental United States except in the subtropical areas of south Texas and Florida. However, in areas where it is capable of surviving, it can produce problems as serious as *B. annulatus* if not more serious. *Boophilus microplus* apparently has a slightly broader host preference than *B. annulatus*, and it usually completes the parasitic period a day or two sooner than *B. annulatus*. Also, the development of resistance to tickicides has been a much greater problem with *B. microplus* than with *B. annulatus*.

There are three important reasons for preventing the reintroduction of *Boophilus* ticks into the Southern United States. First, these ticks are serious pests and parasites of livestock, especially cattle, and in areas where they are endemic they exact tremendous economic losses on livestock by their continual annoyance and bloodsucking, even when there is no transmission of disease agents. In areas of the world where *Boophilus* ticks are a problem, livestock owners have found it necessary to institute regular control programs, often monthly, in order to prevent serious losses. These routine treatments, used as controls rather than eradication tools, often lead to the development of tickicide resistance in *Boophilus* populations. Resistance is a very real problem in Australia, South Africa, and Argentina.

Following the development of resistant tick populations, control becomes much more complicated and many times more costly.

Second, with the introduction of *Boophilus* ticks and the heavy seeding of large areas, cattle tick fever (babesiosis piroplasmosis) ultimately becomes a serious problem. There are several species of *Babesia* organisms which produce babesiosis in cattle, but essentially the conditions are similar, differing only in severity and response to treatment. The *Babesia* destroy the red blood cells causing hemoglobinuria and anemia. This is accompanied by a rise in body temperature, depression, and loss of appetite and body weight. The animal often goes into a coma and dies. In severe outbreaks, mortality may approach 90 percent. Adult cattle are especially susceptible to babesiosis. Unfortunately, several drugs which are effective against babesiosis are not currently marketed in the United States since they do not have clearance from the Food and Drug Administration. In the absence of chemotherapeutic agents for use in an outbreak of babesiosis, the best alternative is to immediately initiate a dipping program at 14-day intervals to

break the life cycle of the tick vector and stop disease transmission by the ticks.

The third, but often overlooked, reason for preventing the reintroduction of *Boophilus* ticks is the fact that they are extremely efficient vectors of bovine anaplasmosis. In the Southern States, bovine anaplasmosis is an economically important disease which causes a loss of approximately \$50 million a year to the livestock industry. In the South, bovine anaplasmosis is primarily transmitted by biting insects, especially horse flies; whereas, in the Northwestern States it is chiefly tick borne and transmitted by species of ticks not established in the Southern States. Insects are mechanical vectors of *Anaplasma marginale*, with a limited potential for disease transmission. Some ticks, *Boophilus* included, are biological as well as mechanical vectors of *A. marginale* and may transovarially transmit anaplasmosis. The reintroduction of *Boophilus* in the South would greatly diminish the hopes of ever eradicating bovine anaplasmosis. Control of the disease would become more difficult and costly with the presence of *Boophilus* ticks.

HUMAN BABESIOSIS

In recent years at least nine persons on Nantucket Island and one person of Martha's Vineyard, Massachusetts, have acquired clinical cases of babesiosis (piroplasmosis).¹ The causative agent is *Babesia microti*, which is a common protozoan blood parasite of rodents in North America. Apparently the disease is rather benign in rodents. The humans infected have complained of chills, fever, pain in the muscles and joints, and fatigue and have shown mild to moderate hemolytic anemia. In Massachusetts, no deaths were reported in the humans with this malaria-like disease.

The laboratory studies of Dr. Spielman of the Harvard School of Public Health suggest that *Ixodes scapularis* serves as a vector of babesiosis on Nantucket Island. Since *I. scapularis* is a very common tick in the Southern States and along the Atlantic coast, possibly other cases of human babesiosis have occurred but have not been correctly diagnosed.

According to Healy *et al.*,² human babesiosis has been reported in other areas of the world, and the circumstances surrounding them differ from the cases in Massachusetts. Two documented cases were observed in Yugoslavia in 1957 and 1969, one from Ireland in 1967, and one from California in 1966. In these four cases, all the patients had previously undergone a splenectomy. Three of the four died; the survivor received an antimalarial drug, whereas the others did not. The cases in Massachusetts all involved persons with intact spleens. In Georgia, an asymptomatic babesiosis infection was diagnosed in a human with an intact spleen.

Persons frequenting areas where *I. scapularis* is a problem should be aware of the possibility of babesiosis transmission by this tick. Human babesiosis should at least be considered in the absence of a specific diagnosis in an illness characterized by chills, fever, fatigue, and painful muscles and joints. Individuals who have had their spleen removed should be especially aware of the potential danger of acquiring babesiosis.

¹Spielman, Andrew. 1976. Human Babesiosis on Nantucket Island Transmission by Nymphal *Ixodes* Ticks. Am. Jour. Trop. Med. and Hyg.: 784-787.

²Healy, George R., Spielman, Andrew, Gleason, Neva. 1976. Human Babesiosis: Reservoir of Infection on Nantucket Island. Science 192: 479-480.

THE TROPICAL BONT TICK

Amblyomma variegatum, the tropical bont ticks, is still causing problems in Puerto Rico in the municipalities of Cidra and Cayey. The number of collections was down to 25 for 1976 as compared to 65 in 1975. Apparently the livestock owners in the infested area are learning to recognize the tick and attempting to coexist with it.

A real threat exists that this tick could also successfully establish itself in the continental United States, especially in subtropical Florida or extreme southern Texas. It is also quite likely that it could survive and

thrive in at least the southern portion of the Gulf Coast States.

Livestock owners, veterinarians, and animal health technicians in these areas should be on the alert for the presence of an unusually large, brightly colored tick. The engorged female often measures three fourths of an inch in length. The male is highly ornamented and smaller than the female. Suspicious ticks should be collected and immediately forwarded to the Veterinary Services Laboratory for identification.

TICKS OF VETERINARY IMPORTANCE

Veterinary Services released the new tick manual entitled "Ticks of Veterinary Importance" (USDA Agriculture Handbook No. 485) in May 1976. The purpose

of this manual is to serve as a training aid and provide basic information on ticks and tick-borne diseases for State and Federal animal health personnel.

REPORT OF ALL TICKS COLLECTED
CALENDAR YEAR 1976

STATE	TOTAL	CATTLE	DOGS	HORSES & MULES	ZOO ANIMALS & MISC.	NATIVE WILDLIFE	ANIMALS OFFERED FOR ENTRY
TOTAL	4528	3430	151	575	47	277	48
Alabama	4	2				2	
Alaska							
Arizona	7	3					4
Arkansas	8	7				1	
California	12	4		3	1		4
Colorado	31		28		3		
Connecticut							
Delaware							
Florida	163	31	1	123	4	1	3
Georgia	26	1				25	
Hawaii							
Idaho	14					14	
Illinois	1				1		
Indiana							
Iowa	1	1					
Kansas	1				1		
Kentucky	7	1				6	
Louisiana	33	1		1		31	
Maine							
Maryland	1					1	
Massachusetts							
Michigan							
Minnesota							
Mississippi							
Missouri	1	1					
Montana	1				1		
Nebraska	1	1					
Nevado							
New Hampshire							
New Jersey	5			1		4	
New Mexico	1	1					
New York	3		1	1			1
North Carolina	4		1		2	1	
North Dakota	19			18	1		
Ohio	4		4				
Oklahoma	9	7			2		
Oregon	1	1					
Pennsylvania	1						1
Rhode Island	2				2		
South Carolina	3	2				1	
South Dakota							
Tennessee							
Texas	3739	3230	65	196	23	194	31
Utah	1		1				
Vermont							
Virginia	1		1				
Washington							
West Virginia							
Wisconsin	1				1		
Wyoming							
Puerto Rico	384	100	49	233	2		
Virgin Islands	38	36			2		

TICK COLLECTIONS FROM ALL HOSTS

Calendar Year 1976

U.S. DEPARTMENT OF AGRICULTURE

VETERINARY SERVICES

ANIMAL AND PLANT HEALTH INSPECTION SERVICE

Calendar Year 1976

U.S. DEPARTMENT OF AGRICULTURE

VETERINARY SERVICES

ANIMAL AND PLANT HEALTH INSPECTION SERVICE

REPORT OF TICKS COLLECTED												PERIOD		CALENDAR YEAR 1976		HOST		CATTLE																																																																																																																																																																																																																																																																																																																																																																																																															
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ANH FORM 5-55
MAY 1971

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

USDA-ARS

Key to Species

- n *Amblyomma inornatum*
- v *Amblyomma variegatum*

TICK COLLECTIONS FROM DOGS

Calendar Year 1976

Total: 151

PUERTO RICO 49	VIRGIN ISLANDS ST. THOMAS ST. JOHN 	ST. CROIX
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ALASKA 	HAWAII KAUAI 	OAHU 	MAUI 	HAWAII
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REPORT OF TICKS COLLECTED														PERIOD	CALENDAR YEAR 1976				HOST	DOGS																																																																																																																																																																																																																																																																									
STATE	TOTAL	AMBL LYOMMA AMERICANUM	AMBL LYOMMA CAJALENSENSE	AMBL LYOMMA MEXICANA	AMBL LYOMMA MEXICANA APP.	ARGAS PERSTENS	BODIPHILUS BREVIPALPIS	BODIPHILUS MICROCELLUS	BODIPHILUS SPP.	DERMACENTOR ALBIPALPIS	DERMACENTOR BREVIPALPIS	DERMACENTOR MEXICANUS	DERMACENTOR MEXICANUS APP.	DERMACENTOR MEXICANUS APP.	DERMACENTOR MEXICANUS APP.	DERMACENTOR MEXICANUS APP.	DERMACENTOR MEXICANUS APP.	DERMACENTOR MEXICANUS APP.	DERMACENTOR MEXICANUS APP.	DERMACENTOR MEXICANUS APP.	DERMACENTOR MEXICANUS APP.	DERMACENTOR MEXICANUS APP.	DERMACENTOR MEXICANUS APP.	DERMACENTOR MEXICANUS APP.	DERMACENTOR MEXICANUS APP.	DERMACENTOR MEXICANUS APP.	DERMACENTOR MEXICANUS APP.	DERMACENTOR MEXICANUS APP.	DERMACENTOR MEXICANUS APP.	DERMACENTOR MEXICANUS APP.	DERMACENTOR MEXICANUS APP.	DERMACENTOR MEXICANUS APP.	DERMACENTOR MEXICANUS APP.	DERMACENTOR MEXICANUS APP.	DERMACENTOR MEXICANUS APP.	DERMACENTOR MEXICANUS APP.	DERMACENTOR MEXICANUS APP.	DERMACENTOR MEXICANUS APP.	DERMACENTOR MEXICANUS APP.	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ANH FORM 5-55
MAY 1971

REPLACES ADE FORM 545, DEC 1954, WHICH IS OBSOLETE

USDA-ARS

Key to Species

d Ixodes kingi
s Ixodes sculptus

TICK COLLECTIONS FROM HORSES AND MULES

Calendar Year 1976

Total: 575

PERIOD	HOST
CALENDAR YEAR 1976	HORSES & MULES

ANH FORM 5-55 MAY 1971 REPLACES AOE FORM 5-55, DEC 1964, WHICH IS OBSOLETE USDA-ARS

TICK COLLECTIONS FROM ZOO ANIMALS AND MISCELLANEOUS HOSTS

Calendar Year 1976

PERIOD	CALENDAR YEAR 1976
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HOST ZOO ANIMALS and MISCELLANEOUS HOST (Sheep, Human, etc.)

ANH FORM 5-55
MAY 1971

REPLACES AOE FORM 5-55, OGC 1268, WHICH IS OBSOLETE.

USDA-ARS

AE	Anteater
SA	Soa Constrictor
C	Cat
CO	Cobra
G	Goat
GK	Grass
H	Human

a Apanomma latum
f Amblyomma dissimile
n Amblyomma nodosum
k Ornithodoros kelleyi

TICK COLLECTIONS FROM NATIVE WILDLIFE

Calendar Year 1976

PERIOD	HOST
CALENDAR YEAR 1976	NATIVE WILDLIFE

ANH FORM 5-55 REPLACES ADE FORM 5-55, DEC 1964, WHICH IS OBSOLETE
MAY 1971 USDA-ARS

Key to Species

g Amblyomma tuberculatum
b Ixodes brunneus
t Ixodes texanus

TICK COLLECTIONS FROM ANIMALS AND PRODUCTS OFFERED FOR IMPORTATION

Calendar Year 1976

Total: 48

REPORT OF TICKS COLLECTED														PERIOD	MOST TICKS FOUND ON ANIMALS & PRODUCTS OFFERED FOR ENTRY INTO THE UNITED STATES									
STATE	TOTAL	AMBL YOMMA	AMBL YOMMA	AMBL YOMMA	AMBL YOMMA	AMBL YOMMA	AMBL YOMMA	AMBL YOMMA	AMBL YOMMA	AMBL YOMMA	AMBL YOMMA	AMBL YOMMA	AMBL YOMMA	CALENDAR YEAR 1976	AMBL YOMMA	AMBL YOMMA	AMBL YOMMA	AMBL YOMMA	AMBL YOMMA	AMBL YOMMA	AMBL YOMMA	AMBL YOMMA	AMBL YOMMA	AMBL YOMMA
TOTAL	48	3																						
ARIZONA																								
Nogales	4																							
CALIFORNIA																								
Calexico	3																							
San Ysidro	1																							
FLORIDA																								
Miami	3																							
NEW JERSEY																								
Clifton	4																							
PENNSYLVANIA																								
Harrisburg I/A	1																							
NEW YORK																								
JFK Airport	1																							
TEXAS																								
Del Rio	1																							
Esque Pass	9																							
El Paso	17																							
Presidio	4																							

ANH FORM 5-55
MAY 1971

REPLACES AEC FORM 5-55, DEC 1968, WHICH IS OBSOLETE

USDA-ARS

Key to Host

AH Animal Hide
BG Baggage
BO Bovine
CP Creosote Plant
D Deer
DR Drecaea (house plant)
F Fern
HO Horse
HH Hedgehog
OK Orchid
RC Reccen
Z Zebra

Key to Species

d *Rhipicephalus decoloratus*
e *Rhipicephalus evertsi*
h *Ixodes hexagonus*
m *Rhipicephalus muehlenbergi*
p *Rhipicephalus pulchellus*
y *Hyalomma albiparvum*

**Prepared by
Veterinary Services
Animal and Plant Health Inspection Service
UNITED STATES DEPARTMENT OF AGRICULTURE**

UNITED STATES DEPARTMENT OF AGRICULTURE

Animal and Plant Health Inspection Service
Hyattsville, Maryland 20782

Official Business
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