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United States
Department of
Agriculture

Animal and
Plant Health
Inspection
Service

Veterinary
Services

APHIS 91-39
August 1983

National Tick Surveillance Program

Calendar Year 1982

PROCUREMENT SECTION
CURRENT SERIAL RECORDS

NOV 17 '83

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National Tick Surveillance Program Calendar Year 1982

During calendar year 1982, the collection and submission of ticks from native and imported animals plus plant and animal material was 3 percent less than in 1981. There were 9,086 collections in 1982, compared to 9,381 in 1981, 7,763 in 1980, 11,553 in 1979, and 12,242 in 1978.

Heartwater Survey in the Caribbean

In 1982 there was continued concern regarding heartwater in the West Indies. Heartwater was reported from the French island of Guadeloupe in the West Indies in 1980.¹ Heartwater is a tick-borne disease of cattle, sheep, and goats caused by the rickettsial agent *Cowdria ruminantium*. The disease is transmitted by ticks of the genus *Amblyomma*. In Africa, where the disease originated, the principal vectors are *Amblyomma hebraeum* and *A. variegatum*, although other African ticks such as *A. pomposum* and *A. gemma* are involved in the natural transmission of heartwater.

There is a particular concern about the report of heartwater in the West Indies since one of the principal vectors, *A. variegatum*, is now established in Puerto Rico, Guadeloupe, Martinique, Antigua, and St. Kitts. There have been no reports of heartwater in Puerto Rico.

The clinical signs of heartwater may vary greatly depending on the virulence of the strain of *Cowdria ruminantium* and the susceptibility of the host. In acute heartwater there may be high fever, nervous signs, diarrhea, depression, a stiff gait, high stepping, exaggerated chewing movements and blinking of the eyes, convulsions, prostration, and death. Mortality in susceptible livestock may range from 30 to 60 percent or higher. Some wild African ruminants (blesbok, springbok, and black wildebeest) may develop inapparent infections and serve as reservoirs of *C. ruminantium*.

Footnotes

1. Perreau, P.; Morel, P. C.; Barre, N. et al: Existence de la cowdriose (heartwater) a *Cowdria ruminantium* chez les ruminants de Antilles francaises (La Guadeloupe) et des Mascareignes (La Reunion et Ile Maurice). Rev. Elev. Med. Vet. Pays Trop. 33:21-22. 1980.

2. Uilenberg, G. Experimental transmission of *Cowdria ruminantium* by the Gulf Coast tick *Amblyomma maculatum*: Danger of introducing heartwater and benign African theileriasis onto the American mainland. Am. J. Vet. Res. Vol. 43 (7):1279-1282. 1982

Recent studies have also shown that at least one North American *Amblyomma* species, *A. maculatum*, is an experimental vector of *C. ruminantium*.² This is an alarming finding since *A. maculatum* is established in all or part of at least 10 States on the U.S. mainland. *A. maculatum* is commonly found from the coastal area of Texas, up into northeastern Oklahoma and southeastern Kansas, and eastward from Texas through the Gulf Coast States into Florida, Georgia, and South Carolina.

In 1982 the U.S. Department of Agriculture sent a team of foreign animal specialists to conduct a survey of six islands in the West Indies. Although evidence of heartwater was not found on Antigua, Dominica, St. Kitts, St. Lucia, Nevis, or St. Vincent, one of the vectors of heartwater, *A. variegatum*, was found on four of the islands.

Additional surveillance studies are planned for 1983. A grant from the U.S. Department of Agriculture to the University of Florida will support further studies in the West Indies. The University of Florida research team will cooperate with the French veterinarians at the Institut National de las Recherche Agronomique at Gardel, Grande Terre, Guadeloupe. They will study the virulence of the West Indian strain of heartwater, the distribution of the disease, and how to prevent the spread of heartwater and *A. variegatum*.

Amblyomma variegatum Eradication in Puerto Rico

Since May 1981, all known *Amblyomma variegatum* premises have been placed under quarantine and systematic treatment. Municipalities known to have infested herds in 1982 include: Cabo Rojo in the southwest; Ponce in the south central; and Cidra, Aibonito, Aguas Buenas, Comerio, Cayey, and Naranjito in the east central part of the island. Also, in 1982, infestations continued to be reported on Vieques, an island off the east coast of Puerto Rico. The National Veterinary Services Laboratories, Pathobiology Laboratory, Ames Iowa, confirmed 50 collections of *A. variegatum* in calendar year 1982 as compared to 87 confirmed collections in calendar year 1981.

Boophilus microplus Eradication in Puerto Rico

The *Boophilus* tick eradication program continued to make progress on two fronts, one in the northwest and the other in the southeast regions of the main lands of Puerto Rico. The northwestern area includes the municipalities of Aguadilla, Moca, Isabela, San Sebastian, and Quebradillas. The southeastern area includes the municipalities of Guardo, Juncos, San

Lorenzo, Las Piedras, Naguabo, Humacao, and Yubucoa. At the end of 1982 approximately 2,400 herds, involving over 72,000 animals, free of ticks in the two quarantine and systematic tick treatment areas.

Important strides in the tick eradication program in 1982 include the development of an effective and close working relationship with commonwealth officials, the appropriate legal structure and action procedures, policies to ensure employee safety while working with pesticides, procedures for handling livestock pesticide toxicosis problems, a Tick Advisory Committee, availability of alternate pesticides, the use of cage vats as an alternative to spraying livestock, and tick and pesticide research projects in Puerto Rico.

Progress Report on the New Cattle Fever Tick Research Laboratory

By the end of fiscal year 1983, the Agricultural Research Service (ARS) will move the Cattle Fever Tick Research Laboratory from Falcon Heights, Texas, to a new \$700,000 facility at Mission, Texas. The new laboratory is located on a 100-acre plot on the northwest corner of the old Moore Air Base near the sterile screwworm fly production plant. The new site will feature the following: (1) separate laboratories for research on tick biology and acaricides, (2) covered animal holding facilities for 64 tick-infested cattle, (3) a modern dipping vat and spraying facilities for acaricide testing, (4) a dipping vat and holding pens exclusively for treating cattle to move them outside the quarantined premises of the laboratory, and (5) about 90 acres of pasture for use as experimental plots. The experimental pastures will permit research on a variety of problems including the role of white-tail deer and exotic game animals in the ecology of *Boophilus* ticks, and the sterile hybrid *Boophilus* eradication method.

Recent Tick Research at the Falcon Heights Laboratory

During the past year samples of both *Boophilus microplus* and *B. annulatus* collected from tick-infested cattle detected in the Tick Eradication Buffer Zone were colonized and bioassayed to determine if acaricide resistant ticks were being introduced from Mexico. As in the past, all of the ticks in the samples tested were completely susceptible. In the event that coumaphos-resistant ticks are detected, knowledge of the efficacies of compounds that are alternatives to coumaphos or other organophosphates will be important in selecting other acaricides for use in the eradication program. None of the nonorganophosphate acaricides tested to date provide 100 percent control of either cattle tick species. However, amitraz, a diamide applied as a spray at 0.015 percent active ingredient,

provided greater than 98 percent controls of the larvae, nymphs, and adults on the cattle at the time of treatment and provided 100 percent residual protection for 7 days, post treatment against reinfestation by larvae. Unfortunately, a formulation of amitraz suitable for use in dipping vats has not been developed for use in the United States.

Tick Research in Puerto Rico

The ARS Tropical Tick Research Laboratory in Mayaguez, Puerto Rico, continues to provide research support to the tick eradication efforts in Puerto Rico. Because of the risk of crotoxyphos (Cio-Rid®) toxicosis both in personnel of the tick eradication force and treated livestock, a safer but efficacious acaricide is needed. Extensive field tests demonstrated that both amitraz and permethrin can be effective replacements for crotoxyphos. Unfortunately, when applied as sprays neither of these compounds controls 100 percent of the ticks on cattle and, therefore, should not be used on the tick quarantine line.

All the potential hosts in Puerto Rico of the tropical bont tick were surveyed for 2 years near Cidra, Puerto Rico, in the heart of the area where the tick occurs. All stages of the tropical bont tick have been collected from goats, horses, and cattle, but not from other domestic animals or wildlife. The limited host-range in Puerto Rico of this tick will greatly simplify efforts to eradicate it.

Boophilus Program in Texas

In 1982 Veterinary Services Tick Eradication personnel apprehended 81 head of Mexican livestock along the Texas-Mexico border areas from Brownsville to the Amistad Dam near Del Rio. This compared to 76 apprehensions in fiscal year 1981. Thirty-four of the 1982 apprehensions were cattle, of which 14 were infested with *Boophilus* ticks. Forty-seven apprehensions were horses, of which none was tick infested. Thirty-four Texas premises were placed under quarantine as the result of exposure to infested Mexican livestock. Five new *Boophilus* infested premises were found in the Free Area and 15 in the Buffer Area during fiscal year 1982.

In October 1982, Congress passed Public Law 97-312 which provides that tick inspectors who have been designated by the Secretary of Agriculture and the U.S. Attorney General can carry firearms for self-protection. Inspectors authorized to carry firearms must first receive firearms training at the Federal Law Enforcement Center, Glynco, Georgia. The first class of 24 tick inspectors is tentatively scheduled to begin training in December 1983.

New Formulation of Coumaphos

For many years arsenicals were used as the acaricide in official U.S. tick Eradication Program work. Because of environmental hazards of arsenic residues in the formulation used to dip cattle, use of arsenical solutions was discontinued in 1973.

Coumaphos, formulated as CoRal® Animal Insecticide 25% Wettable Powder, was selected in 1969 for use in official Tick Eradication Programs. Coumaphos has proven to be a very effective acaricide. The wettable powder formulation does have an undesirable characteristic; i.e., very rapid settling out of suspension. This settling out characteristic makes dipping vat management difficult.

Bayvet Corporation is now marketing a flowable formulation of coumaphos, CoRal® Flowable Cattle Insecticide. The flowable formulation is equally effective against ticks and virtually eliminates the problems of settling out of the suspension. Unfortunately, the current registered label for flowable coumaphos does not list horses as an animal that may be treated.

The Tick Force currently has three vats charged with the flowable formulation of coumaphos. Samples are taken from the vats each time animals are dipped, and, to date, all samples have been within the recommended pesticide concentration. As the supply on hand of wettable powder is depleted, additional vats will be charged with the flowable coumaphos.

Use of the flowable formulation of coumaphos should result in more efficient vat management and ensure that all animals are treated with the recommended concentration of pesticide.

Suggestions to Protect Livestock from *Boophilus* Ticks

According to Dr. John Gray, Tick Epidemiologist, South Central Region, prevention of tick infestation starts with the livestock owner. No State or Federal agency can provide the day-to-day protective measures that the owner can provide.

Prevention starts with good fences that keep the livestock on clean, non-infested land and protect the ranch from becoming exposed to tick-infested stray livestock.

Domestic livestock, principally cattle, are usually responsible for spreading ticks. Know the movements of livestock within the ranch and maintain records of

movements. In the event that part of the ranch becomes tick infested, the infestation can be defined and eradicated rapidly.

If one or more pastures are at high risk to ticks, always have the livestock from such pastures inspected and dipped by tick program personnel before moving these livestock to other pastures.

When purchasing new animals—be safe. Have the new animals inspected and dipped before bringing them onto the ranch.

Horses at risk to ticks should be on 14-day treatment to prevent the introduction of ticks. Ask the tick program personnel if your horses should be on a “14-day pass.”

Livestock owners ranching in high-risk areas of tick infestation should always be alert to the possibility of tick infestation. They should take special precautions to prevent the introduction and spread of ticks.

Tick Collections From All Hosts CY 1982

HOST	

All Hosts

USDA-ARS

Tick Collections From Animals And Products Offered For Entry CY 1982

HOST

Animals and Products
for Entry

ANN FORM 5-55
MAY 1971

REPLACES ADE FORM 5-65, DEC 1964, WHICH IS OBSOLETE

USDA-ARS

Key to Species

s Dermacentor parumapertus
aa Haemaphysalis longicornis (= H.
d Dermacentor hunteri bispinosus)
dn Dermacentor nuttalli

★★ Nymphal Stage

Tick Collections From Cattle

CY 1982

Total 7118

REPORT OF TICKS COLLECTED															PERIOD		HOST												
															Calendar Year 1982				Cattle										
STATE	TOTAL	AMBLIOMMA AMERICANA	AMBLIOMMA CALLENNENSE	AMBLIOMMA INTA TOR	AMBLIOMMA MACULATUM	AMBLIOMMA SPP.	ARGAS PERICUS	BOOPHILUS ANNULATUS	BOOPHILUS MICROPLUS	BOOPHILUS SPP.	DERMACENTOR ALBIPICUS	DERMACENTOR SPINIOSUS	DERMACENTOR VENTRIOSUS	DERMACENTOR NIGROLINEATUS	DERMACENTOR RITZELI	DERMACENTOR OCCIDENTALIS	DERMACENTOR VARIANS	DERMACENTOR SPP.	HAEMAPHYSALIS PARVULUS	IXODES COCKEII	IXODES PACIFICUS	IXODES SCAPULARIS	IXODES SPP.	ORNITHODOROS SPP.	OTOBUS MEGINI	RHIPICEPHALUS SANGUINEUS	RHIPICEPHALUS SPP.	MISCELLANEOUS SPP.	
TOTAL	7118	647	437	10	1975	44		18	2201	2	189		35	202		1171	20	2				29			123	13			
Alabama	3	1			2																								
Alaska																													
Arizona	1									1																			
Arkansas	4	3														1													
California	1																								1				
Colorado																													
Connecticut																													
Delaware																													
Florida	81	20			38											12						9				2			
Georgia	13	4			1											7						1							
Hawaii																													
Idaho	5									3																2			
Illinois																													
Indiana																													
Iowa																													
Kansas	7				1											6													
Kentucky	3															3													
Louisiana																													
Maine																													
Maryland																													
Massachusetts																													
Michigan																													
Minnesota																													
Mississippi	6	2			4																								
Missouri																													
Montana																													
Nebraska	2				1											1													
Nevada																													
New Hampshire																													
New Jersey																													
New Mexico																													
New York																													
North Carolina	1															1													
North Dakota																													
Ohio																													
Oklahoma	15	5			2																	4				4			
Oregon	1										1																		
Pennsylvania																													
Rhode Island																													
South Carolina	11	3			2											6													
South Dakota																													
Tennessee	21	9														11						1							
Texas	4533	599	437	10	1779	55** 90 ⁿ		18	39	2**	184		35			1123	20**	2				14				116	10		
Utah																													
Vermont																													
Virginia	1	1																											
Washington																													
West Virginia																													
Wisconsin																													
Wyoming																													
Puerto Rico	2409				44 ^v				2162					202													1		
Virgin Islands																													

AMNH Form 5-55
MAY 1971

REPLACES AOE FORM 5-65, DEC 1968, WHICH IS OBSOLETE

Key to Species

v Amblyomma variegatum
n Amblyomma inornatum

** Nymphal Stage

USDA-ARS

Tick Collections From Dogs CY 1982

Tick Collections From Horses And Mules CY 1982

REPORT OF TICKS COLLECTED															PERIOD		HOST												
STATE															Calendar Year 1982				Horses and Mules										
	TOTAL	AMBL.YOMMA AMERICANA	AMBL.YOMMA CALIFENNESE	AMBL.YOMMA MITATOR	AMBL.YOMMA MACULITUM	AMBL.YOMMA SPP.	ARGAS PERICUS	BOOPHILUS ANULATUS	BOOPHILUS MICROPLUS	BOOPHILUS SPP.	DERMACENTOR ALBIPESUS	DERMACENTOR BREVIPALPUS	DERMACENTOR LEWISII	DERMACENTOR NIGROLINEATUS	DERMACENTOR RITENUS	DERMACENTOR OCCIDENTALS	DERMACENTOR VARIABILIS	DERMACENTOR SPP.	HAEMAPHYSALUS PARVUS	IXODES COCKLEI	IXODES PACIFICUS	IXODES SCAPULARIS	IXODES SPP.	ORNITHODOROS SPP.	OTOBUS MEGINII	RHIPICEPHALUS SANGUINEUS	RHIPICEPHALUS SPP.	MISCELLANEOUS SPP.	
TOTAL	882	18	41	8	54	6		20		30		27	125		561	4	1					3				1	2		
Alabama																													
Alaska																													
Arizona																													
Arkansas																													
California																													
Colorado	1																								1				
Connecticut																													
Delaware																													
Florida	22				6								12		1							2					1		
Georgia																													
Hawaii																													
Idaho																													
Illinois																													
Indiana																													
Iowa																													
Kansas																													
Kentucky	2														2														
Louisiana																													
Maine																													
Maryland																													
Massachusetts																													
Michigan																													
Minnesota																													
Mississippi																													
Missouri																													
Montana																													
Nebraska																													
Nevada																													
New Hampshire																													
New Jersey																													
New Mexico																													
New York																													
North Carolina																													
North Dakota																													
Ohio																													
Oklahoma																													
Oregon	1									1																			
Pennsylvania																													
Rhode Island																													
South Carolina																													
South Dakota																													
Tennessee																													
Texas	724	18	41	8	48	2**		1		29		8	4		558	4**	1				1						1		
Utah																													
Vermont																													
Virginia																													
Washington																									</				

ANH Form 5-55
MAY 1971

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

Key to Species

v *Amblyomma variegatum*

**Nymphal Stage

USDA-ARS

14

REPORT OF TICKS COLLECTED														PERIOD	HOST																										
														Calendar Year 1982														Native Wildlife													
STATE	TOTAL	AMBLIOMMA AMERICANUM	AMBLIOMMA CAJALPENSE	AMBLIOMMA IMITATOR	AMBLIOMMA MACULATUM	AMBLIOMMA SPP.	ARGAS PERSCICUS	BIOIPHILUS ANNULATUS	BIOIPHILUS MICROPHILUS	BIOIPHILUS SPP.	DERMACENTOR ALBIPICTUS	DERMACENTOR BREVIPALPUS	DERMACENTOR DESCRIPTUS	DERMACENTOR VIRGILII	DERMACENTOR SPP.	HAEMAPHYSALIS PARVULUS	IALEXES CORREI	IALEXES PACIFICUS	IALEXES SCAPULARIS	IALEXES SPP.	ORNITHODOROS SPP.	OTIOBIUS MEGNI	RHIPICEPHALUS SANGUINEUS	RHIPICEPHALUS SPP.	MISCELLANEOUS SPP.																
TOTAL	46D	113	5		17	1B				B9		19			47	9	1D1	6		23	11			2																	
Alabama	6	5D			1D																																				
Alaska																																									
Arizona																																									
Arkansas	34	32D																		2BC																					
California																																									
Colorado																																									
Connecticut																																									
Delaware																																									
Florida	8	6D													1RC					1D																					
Georgia	7D	15FY 33D			3D										4RC 1FY		1TD**	3RC		1FY 4D																					
Hawaii		1RC																																							
Idaho																																									
Illinois																																									
Indiana																																									
Iowa																																									
Kansas																																									
Kentucky	14	3RC 1GF													5RC			2RC 1GF			2RC ^t																				
Louisiana	1				1D																																				
Maine																																									
Maryland	6	5D													1BB																										
Massachusetts																																									
Michigan	3																																								
Minnesota																																									
Mississippi																																									
Missouri																																									
Montana																																									
Nebraska																																									
Nevada																																									
New Hampshire																																									
New Jersey																																									
New Mexico																																									
New York																																									
North Carolina	3											1D								1D			1RC ^t																		
North Dakota																																									
Ohio																																									
Oklahoma	7										1D									4BC 1D, 1GF																					
Oregon																																									
Pennsylvania																																									
Rhode Island																																									
South Carolina	23	5D 1BD*			1D										7D					7D			1B ^b																		
South Dakota																																									
Tennessee																																									
Texas	2B5	2RC 1BC, 3DGD, 2J			11D	2D ⁿ 3R ⁿ 13D				BBD		11D			BBC 2D 1RC 14CD BJ 1GF	9D**	1D** 99R			1D				1D 1R																	
Utah																																									
Vermont																																									
Virginia																																									
Washington																																									
West Virginia																																									
Wisconsin																																									
Wyoming																																									
Puerto Rico																																									
Virgin Islands																																									

AMNH Form 5-55
MAY 1971

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

USDA-ARS

Key to Host

B Bird
BB Black bear
BC Bobcat
BD Badger
BI Bluebird
CO Coyote
D Deer
FY Feral Swine
GF Grey Fox
J Javelina (peccary)
R Rabbit
RC Raccoon
TD Towhee

Key to Species

a Ixodes affinis
b Ixodes brunneus
n Amblyomma inornatum
t Ixodes texanus

*Drigin Kansas

**Nymphal Stage

Bracketed figures refer to state indicated

Tick Collections From Zoo Animals And Miscellaneous Hosts CY 1982

HOST	

Calendar Year 1982

Zoo Animals and
Miscellaneous Hosts

ANH Form 5-55

REPLACES AOE FORM 3-55, DEC 1954, WHICH IS OBSOLETE.

Key to Host

Key	to host		
C	Cat	Q	Hoat not given
CL	Clothing	S	Sheep
G	Goat	X	Inanimate object
H	Human	Y	Swine
HM	Dwelling	ZO	Zoo Office
HS	Horse Stall		

Key to Species

ta	<u>Ornithodoros talaje</u>
v	<u>Amblyomma variegatum</u>
ar	<u>Amblyomma rotundatum</u>

*Animal from an Eastern State

••Nymphal Stage

Bracketed figures refer to state indicated

USDA-ARS