STATE OF NEVADA

BIENNIAL REPORT

OF THE

State Department of Agriculture

For the Period
July 1, 1936, to June 30, 1938, Inclusive

CARSON CITY, NEVADA
STATE PRINTING OFFICE - - JOE FARNSWORTH, SUPERINTENDENT
1938


TYPOGRAPHICAL
UNION
LABEL
WASHOE

REPORT OF STATE DEPARTMENT OF AGRICULTURE

To His Excellency, HON. RICHARD KIRMAN, SR., *Governor of Nevada.*

SIR: In accordance with the provisions of chapter 172, Statutes of Nevada 1931, we herewith submit the second report of the State Department of Agriculture, same being the twelfth report of the State Board of Stock Commissioners, for the period from July 1, 1936, to June 30, 1938.

PERSONNEL

Administrative—

FRANK CALLAWAY, President.....Currant, Nye County
H. F. DANGBERG, Vice President.....Minden, Douglas County
H. H. CAZIER, Commissioner.....Wells, Elko County
EDWARD RECORDS, Secretary and Executive Officer.....Reno
LOUISE LEWERS, Associate Secretary.....Reno
ARMENA FRITZ, Clerk.....Reno

Division of Animal Industry—

WARREN B. EARL, Director.....Reno
F. E. HENDERSON, District Veterinarian.....Elko
F. H. BAKER,* Veterinarian.....Gardnerville
W. H. HILTS,* Veterinarian.....Reno
WM. R. SMITH,* Veterinarian.....Las Vegas
JOE F. PERKINS,* District Brand Inspector.....Overton
WM. R. SMITH,* District Brand Inspector.....Las Vegas
CHAS. CULVERWELL,* District Brand Inspector.....Caliente
JOHN W. COLE,* District Brand Inspector.....Pioche
JOHN W. RICHARDS,* District Brand Inspector.....Alamo

Division of Plant Industry—

GEORGE G. SCHWEIS, Director.....Reno
LEE M. BURGE, Supervising Inspector.....Reno
P. A. LEHENBAUER, Seed Analyst and Botanist.....Reno
F. E. DRESSLER,* Weed Inspector.....Minden
C. H. BURKE,† Deputy Quarantine Officer.....Reno

During the biennium the following were engaged in cooperative projects between the U. S. Department of Agriculture and the State Department of Agriculture in insect pest control, salaries being paid by the Federal Bureau of Entomology and Plant Quarantine:

GEORGE M. SHOGREN, General Supervisor Mormon Cricket Control, Reno.

DONALD M. LEIGHTON, Area Supervisor Mormon Cricket Control, Wells.

*On per diem basis. †Employed by Washoe County.

B. F. ROBERTS, Area Supervisor Mormon Cricket Control, Duckwater.

THOMAS BRADSHAW, Area Supervisor Mormon Cricket Control, Reno.

C. W. JENSEN, State Supervisor Grasshopper Control, Ely.

TAX LEVIES

At a regular meeting held on October 12, 1936, the board set the special tax for the Stock Inspection Fund, in accord with chapter 37, Statutes of Nevada 1935, at two mills on the dollar for the year 1937. At a regular meeting held on October 11, 1937, the tax was set at three mills on the dollar for the year 1938

ASSESSED VALUATION OF LIVESTOCK UNDER THE JURISDICTION OF THIS BOARD FOR THE YEARS 1936–1937

(Figures from the Report of the Nevada Tax Commission. Figures for the year 1938 not available at this date.)

	1936	1937
Stock cattle	$3,814,752.00	$3,621,295.00
Bulls	254,682.00	268,755.00
Milch cows	343,711.00	408,905.00
Horses (1,100 pounds and up)	439,575.00	449,290.00
Work horses (under 1,100 pounds)	50,550.00	103,735.00
Driving horses	11,240.00	12,180.00
Saddle horses	143,140.00	158,285.00
Stock horses	133,252.00	159,597.00
Stallions	12,725.00	14,905.00
Brood mares	5,000.00	11,400.00
Work mules	17,740.00	20,375.00
Stock mules	11,955.00	8,630.00
Jacks	650.00	1,050.00
Burros	3,485.00	3,650.00
Hogs (over 8 months)	15,950.00	15,000.00
Pigs (under 8 months)	7,006.00	11,527.00
Poultry	24,986.00	25,653.00
Foxes	685.00	385.00
Total	$5,291,084.00	$5,294,617.00

NEW LEGISLATION

There was no major new legislation directly affecting the work of the department during the biennium. The Act governing the recording of brands was amended by chapter 80, Statutes of Nevada 1937, simplifying the transfer and mortgaging of brands and bringing the procedure more in accord with present-day conditions in the livestock industry.

Chapter 148, Statutes of Nevada 1937, made an appropriation of $10,000 for the control of rodents in cooperation with the United States Bureau of Biological Survey. This made possible the initiation of an often badly-needed activity not previously authorized.

STATEMENT OF DISBURSEMENTS FROM THE STOCK INSPECTION FUND

July 1, 1936, to June 30, 1938

	July 1, 1936, to June 30, 1937	July 1, 1937, to June 30, 1938
Salaries and wages	$8,379.33	$6,891.42
Railroad transportation	185.82	113.60
Automobile transportation	3,105.04	2,951.38
Subsistence	327.45	329.52
Office rent	900.00	900.00
Post office box rent	6.00	6.00
Telegraph and telephone	204.74	144.94
Postage and printing	800.29	16.50
Freight and express	11.19	6.29
Industrial insurance	99.03	85.85
Bond premiums	42.40	20.00
Dues, U. S. Livestock Sanitary Association	25.00	25.00
Advertising—Estrays	25.74	32.43
Indemnities	33.33	
Equipment and supplies	389.15	152.51
Totals	$14,534.51	$11,675.44
Grand total		$26,209.95

Net Receipts from All Sources Other Than Tax Levies

July 1, 1936, to June 30, 1938

	July 1, 1936, to June 30, 1937	July 1, 1937, to June 30, 1938
New brand recordings	$310.00	$268.00
Brand transfers	64.00	68.00
Milk inspection, city of Elko	240.00	240.00
Inspection of brands—Brand inspection districts	277.30	226.25
Livestock shipment inspections	10.00	5.00
Sales—Brand book	240.00	37.50
Estray funds held in escrow for one year	14.40	68.70
Miscellaneous collections	1.54	8.00
Totals	$1,157.24	$921.45
Grand total		$2,078.69
Net expenditures from Stock Inspection Fund		$24,131.26

EXPENDITURES FROM UNEXPENDED BALANCE OF THE STOCK COMMISSION SPECIAL FUND (Chapter 47, Statutes of Nevada 1935) APPROPRIATION OF $10,000 FROM GENERAL FUND FOR PERIOD FROM JULY 1, 1935, TO JUNE 30, 1937, AND FROM STOCK COMMISSION SPECIAL FUND (Chapter 183, Statutes of Nevada 1937) APPROPRIATION OF $10,000 FROM GENERAL FUND FOR PERIOD FROM JULY 1, 1937, TO JUNE 30, 1939.

	July 1, 1936, to June 30, 1937	July 1, 1937, to June 30, 1938
Salaries and wages	$2,959.34	$3,705.09
Automobile transportation	142.58	207.00
Subsistence	13.90	9.25
Telephone and telegraph	.....	12.78
Freight and express	34.60	29.07
Postage and printing	22.45	100.64
Industrial insurance	30.72	39.24
Repairs	.75	
Tuberculosis indemnities	299.48	92.43
Equipment (eartags, etc.)	371.20	420.53
Totals	$3,875.02	$4,616.03
Unexpended balance reverted June 30, 1937	$1,823.40	

HELD IN BANK IN ESCROW

Balance in Estray Fund—1 year estray escrow	$11.80
Deposits for hide and carcass stamping outfits	240.00
Total	$251.80

EXPENDITURES FOR SUPPORT OF INSECT AND PLANT PEST QUARANTINE AND CONTROL (Chapter 280, Statutes of Nevada 1913; Chapter 134, Statutes of Nevada 1927; Sections 426–448, Nevada Compiled Laws 1929) FROM BALANCE OF APPROPRIATION OF $8,400 FROM GENERAL FUNDS COVERING PERIOD FROM JULY 1, 1935, TO JUNE 30, 1937, AND $8,400 APPROPRIATION FROM GENERAL FUND COVERING PERIOD FROM JULY 1, 1937, TO JUNE 30, 1939.

	July 1, 1936, to June 30, 1937	July 1, 1937, to June 30, 1938
Salaries	$2,825.50	$2,775.00
Railroad transportation	73.28	143.99
Automobile transportation	613.08	212.64
Subsistence	186.82	178.43
Telephone and telegraph	155.21	111.01
Postage and printing	36.75	26.00
Industrial insurance	33.64	30.94
Rent	225.00	525.00
Freight and express	2.99	1.64
Equipment and supplies	203.93	78.13
Dues in Western Plant Quarantine Board; National Association of Secretaries, Commissioners and Departments of Agriculture; and American Association of Economic Entomologists	20.00	45.00
Totals	$4,376.20	$4,127.78

EXPENDITURES FOR NOXIOUS WEED CONTROL (Chapter 174, Statutes of Nevada 1929, Sections 414–435, Nevada Compiled Laws 1929) FROM BALANCE OF APPROPRIATION OF $8,000 FROM THE GENERAL FUND FOR PERIOD JULY 1, 1935, TO JUNE 30, 1937, AND $8,000 APPROPRIATION FROM GENERAL FUND COVERING PERIOD FROM JULY 1, 1937, TO JUNE 30, 1939.

	July 1, 1936, to June 30, 1937	July 1, 1937, to June 30, 1938
Salaries and wages	$2,631.37	$2,857.00
Railroad transportation	15.40	10.84
Automobile transportation	620.40	588.10
Subsistence	342.35	253.35
Telegraph and telephone	5.25	6.59
Postage and printing	35.00	
Industrial insurance	32.83	34.51
Rent	225.00	225.00
Freight and express	.74	1.70
Equipment and supplies	91.66	1.25
Totals	$4,000.00	$3,978.34

EXPENDITURES FOR AGRICULTURAL SEED CONTROL (Chapter 203, Statutes of Nevada 1929, Sections 398–413, Nevada Compiled Laws 1929) FROM BALANCE OF APPROPRIATION OF $4,000 FROM THE GENERAL FUND FOR PERIOD JULY 1, 1935, TO JUNE 30, 1937, AND $4,000 APPROPRIATION FROM GENERAL FUND COVERING PERIOD FROM JULY 1, 1937, TO JUNE 30, 1939.

	July 1, 1936, to June 30, 1937	July 1, 1937, to June 30, 1938
Salaries and wages	$1,450.01	$1,825.01
Automobile transportation	111.30	28.28
Subsistence	5.00	5.10
Postage and printing	26.00	
Industrial insurance	17.78	19.91
Rent	225.00	75.00
Equipment and supplies	79.80	
Dues—Association of Official Seed Analysts of North America	10.00	10.00
Totals	$1,924.89	$1,963.30
Net Receipts from All Sources Other Than Appropriation		
Fees for certification of seed	$2.00	$9.00
Totals	$2.00	$9.00

EXPENDITURES FOR GRADING AND STANDARDIZATION OF EGGS (Chapter 220, Statutes of Nevada 1931) FROM BALANCE OF APPROPRIATION OF $1,200 FROM THE GENERAL FUND FOR PERIOD JULY 1, 1935, TO JUNE 30, 1937, AND $1,200 APPROPRIATION FROM THE GENERAL FUND COVERING PERIOD FROM JULY 1, 1937, TO JUNE 30, 1939.

	July 1, 1936, to June 30, 1937	July 1, 1937, to June 30, 1938
Stage and railroad transportation	.....	$34.40
Subsistence	.....	30.32
Total	.....	$64.72
Unexpended balance reverted June 30, 1937	$1,200.00	

EXPENDITURES FOR GRADING AND STANDARDIZATION OF AGRICULTURAL PRODUCTS (Chapter 225, Statutes of Nevada 1931) FROM BALANCE OF APPROPRIATION OF $4,000 FROM THE GENERAL FUND FOR PERIOD JULY 1, 1935, TO JUNE 30, 1937, AND $4,000 APPROPRIATION FROM THE GENERAL FUND COVERING PERIOD FROM JULY 1, 1937, TO JUNE 30, 1939.

	July 1, 1936, to June 30, 1937	July 1, 1937, to June 30, 1938
Salaries and wages	$1,455.77	$1,421.80
Railroad transportation	2.93	
Automobile transportation	392.18	428.03
Subsistence	90.90	291.12
Telephone and telegraph	35.18	20.10
Postage and printing	37.90	.10
Industrial insurance	18.74	18.07
Rent	225.00	75.00
Equipment and supplies	27.02	72.55
Totals	$2,285.62	$2,326.77

Net Receipts from All Sources Other Than Appropriations

	July 1, 1936, to June 30, 1937	July 1, 1937, to June 30, 1938
Grading Fees—		
Hay	$87.90	
Turkeys	191.78	$106.15
Potatoes	.....	161.70
Sale of tags	.....	45.45
Totals	$279.68	$313.30

EXPENDITURES FOR INSECT PEST CONTROL (Chapter 182, Statutes of Nevada 1937) FROM BIENNIAL APPROPRIATION OF $10,000 FROM THE GENERAL FUND COVERING PERIOD FROM APRIL 1, 1937, TO JUNE 30, 1939.

	April 1, 1937, to June 30, 1937	July 1, 1937, to June 30, 1938
Salaries and wages	$164.65	$2,036.74
Railroad transportation	17.49	50.58
Automobile transportation	14.10	1,479.86
Subsistence	188.90	410.30
Telephone and telegraph	41.93	127.69
Industrial insurance	.....	27.94
Airplane dusting experiment	.....	1,470.00
Miscellaneous transportation	.....	8.50
Equipment and supplies	661.24	1,105.45
Freight and express	5.50	114.68
Totals	$1,093.81	$6,831.74

(This appropriation became available immediately upon its approval, March 26, 1937.)

EXPENDITURES FROM RODENT CONTROL FUND (Chapter 148, Statutes of Nevada 1937) APPROPRIATION OF $10,000 FROM GENERAL FUND FOR PERIOD FROM JULY 1, 1937, TO JUNE 30, 1939.

	July 1, 1937, to June 30, 1938
Salaries and wages	$2,758.65
Automobile transportation	19.42
Subsistence	1.25
Poisoned bait	788.87
Industrial insurance	37.25
Freight and express	35.69
Totals	$3,641.13

RECOMMENDATIONS

We would again strongly recommend the financing of the Division of Plant Industry by a single lump sum appropriation from the General Fund, rather than by a multiple of small appropriations as in the past. This would result in more flexibility between sessions of the Legislature to meet rapidly changing conditions and make greater efficiency and economy possible.

We would also recommend that the system of financing at least an equitable proportion of the work of controlling livestock diseases communicable to human beings from the General Fund and not exclusively from the Stock Inspection Fund, be continued.

We would most strongly recommend that the 1939 Legislature repeal chapter 2, Statutes of Nevada 1935, the initiative predatory

animal bounty Act. This law never became operative, having been declared defective by the courts, but there is a possibility that it might through some legal technicality hamper legitimate work for the control of predatory animals. With this Act repealed, the way would certainly be clear for the orderly and systematic control of predatory animals by this department in cooperation with other State and Federal agencies. Such a free hand would be vital to the protection of our livestock and the public health if Nevada should have another outbreak of rabies, which is more than probable, as the disease is prevalent in two adjoining States.

It is our belief that the time has arrived when the Legislature should make provision by suitable statutes for at least supervision and standardization of meat and milk inspection throughout the State by this department. At present, work along these lines is practically limited to the activities of some of our counties and municipalities. This results in a lack of uniformity unsatisfactory to producers and consumers alike and, in addition, leaves the people over most of our State's area without any protection against the marketing of at least potentially dangerous milk and meat.

CONCLUSION

There are appended hereto the reports of the Divisions of Animal Industry and Plant Industry prepared by the respective Directors of same and a brief résumé of the work done for rodent control. These cover, we believe, in sufficient detail the work of the past two years and the results accomplished.

In conclusion we wish to extend our thanks to our own personnel, the cooperating organizations and individuals, and the public at large, whose assistance and cooperation have made these results possible.

Respectfully submitted,

FRANK CALLAWAY,
H. F. DANGBERG,
H. H. CAZIER,
Commissioners.

EDWARD RECORDS, *Executive Officer.*

DIVISION OF ANIMAL INDUSTRY

WARREN B. EARL, *Director*

A brief review of the more important activities of the division for the period from July 1, 1936, to June 30, 1938, follows:

BRAND RECORDINGS

The recording of brands has continued in a routine manner during the past biennium. Brands now of record will so remain, unless transferred or abandoned, until the end of the next rerecording period, which closes December 31, 1940. The brand recording figures are as follows:

Total number of brands of legal record July 1, 1936	2,307
New brands recorded July 1, 1936, to June 30, 1938	281
Total brands of legal record June 30, 1938	2,588

BRAND BOOK SUPPLEMENT

During the preceding biennium in 1936, an Official Brand Book was published. Since that time a considerable number of new brands have been recorded, and the publication of a supplement to the Brand Book of 1936 appears necessary. This supplement will show all brands recorded or transferred after issuance of the 1936 Brand Book up to September 15, 1938, and will be ready for distribution in the fall of 1938.

STOCK KILLED ON RAILROAD RIGHTS OF WAY

Reports received during the period July 1, 1936, to June 30, 1938, under the provisions of sections 6345–6355 Nevada Compiled Laws 1929, show the following livestock killed on railroad rights of way:

	Cattle	Horses	Sheep	Totals
Western Pacific—				
Brands or owners reported	157	6	71	234
Brands or owners not reported	28	12	21	61
Union Pacific—				
Brands or owners reported	136	15	....	151
Brands or owners not reported	22	5	....	27
Southern Pacific—				
Brands or owners reported	89	3	14	106
Brands or owners not reported	21	2	2	25
Nevada Northern—				
Brands or owners reported	15	3	5	23
Brands or owners not reported	2	1	1	4
Virginia and Truckee—				
Brands or owners not reported	....	1	....	1
Nevada Copper Belt—				
Brands or owners reported	1	....	....	1
Tonopah and Goldfield—				
Brands or owners reported	2	....	....	2
Totals	473	48	114	635

ESTRAYS

The handling of estrays has continued with less misunderstanding

and friction than formerly, due to a better understanding of the conditions under which estrays are taken up and disposed of, and to less confusion between estrays and animals of known ownership trespassing on the property of others or running on public property.

The actual figures covering estrays handled during the past biennium are as follows:

Cattle—			
Taken up as estrays		12	
Returned to owners	9		
Sold	3		
Horses—			
Taken up as estrays		3	
Returned to owners	0		
Sold	3		
Total animals handled for period July 1, 1936, to June 30, 1938		—	15
Last Biennium—			
Cattle	15		
Horses	18		
		—	33
Decrease in cattle as compared with last biennium			3
Decrease in horses as compared with last biennium			15

SLAUGHTERHOUSE INSPECTION

Active participation in this activity has been held in abeyance anticipating legislation establishing meat inspection on a State-wide basis.

Inspection under municipal ordinance has continued in Reno, Fallon, Yerington and Las Vegas, and under a Douglas County ordinance, in Gardnerville, and the number of small rural slaughterhouses is decreasing.

In a few cases following reports of insanitary conditions, investigations have been made and excellent cooperation obtained in carrying out suggestions for improvement of conditions.

HIDE AND CARCASS INSPECTION

A force of 90 inspectors, consisting mostly of sheriffs, deputies and other peace officers, has continued to conduct hide and carcass inspection and stamping during the past biennium.

Where peace officers were not available, other persons have been appointed as inspectors, and a special effort has been made to avoid causing inconvenience through the hauling of beef unreasonable distances for inspection. Personal contacts with inspectors in remote areas have been made, insofar as possible, and in nearly all cases they were found to be functioning properly.

The record books of inspectors are kept on file in the offices of the State Department of Agriculture, and are available in disputes or legal actions involving the ownership of cattle.

The contribution of this service to livestock theft prevention has apparently justified its continuance.

BRAND INSPECTION

Brand inspection has continued in the two brand inspection districts previously created as such by this department, one consisting of Clark County and one of Lincoln County. No new districts have

been created nor have applications been received for the creation of such districts, although the subject has been discussed locally in several sections.

Such cooperation as is possible has been given the Nevada State Cattle Association in the matter of brand inspection of Nevada cattle in public stockyards, and copies of the Nevada Brand Book, as well as supplementary sheets showing newly recorded brands, are supplied to brand inspectors in stockyards to which Nevada cattle are shipped.

DISEASES OF LIVESTOCK

No epidemics of the devastating diseases have caused great losses of livestock during the past biennium but there has been considerable loss from anthrax and equine encephalomyelitis (brain fever), and lesser losses have occurred from blackleg, hemoglobinuria (red water of cattle) and hog cholera.

No restrictive quarantines have been necessary, although a minor outbreak of cattle scabies caused some inconvenience to a limited number of ranchers.

Continued improvements in vaccines and serums, and the possibility of a more economical use of these biological products, have contributed materially to a successful control of the infectious diseases. The prevention of some diseases such as blackleg has become routine, and losses are due solely to neglect of owners to immunize their animals.

Diseases of the respiratory tract of horses, variously referred to as influenza, strangles, distemper, etc., have caused some losses and have become of increasing economic importance, as they frequently occur during haying operations, delaying the progress of this work by the necessary laying off of sick horses and occasional death losses. A few losses of valuable show and breeding animals have called attention to the necessity for developing methods for the prevention and control of this disease. It is believed that research leading to this end may be conducted by the cooperating agencies in Nevada, as well as elsewhere, in the near future.

Routine tuberculin testing necessary to maintain the status of the State as a modified tuberculosis free accredited area, as well as other testing for tuberculosis in the interest of the public health, has been continued with the cooperation of the Bureau of Animal Industry, United States Department of Agriculture.

Bang's disease testing under the Federal plan has been continued, and this work, formerly limited to dairy cattle, has been extended to beef and range cattle with a constantly increasing demand for assistance in eradicating this disease.

Special reference is made to certain diseases of particular importance, as well as to those in which tabulated statistics are furnished elsewhere in this report.

ENCEPHALOMYELITIS

This disease, commonly called brain fever of horses and mules, was referred to in the last biennial report of this division as an investigational problem in which the activities of this department were confined to cooperation with the Agricultural Experiment Station and the

State Veterinary Control Service of the University of Nevada. During the two years following the above report, however, the status of the disease has been gradually changing from that of a research project to one of routine disease control, in which the Division of Animal Industry has more actively participated.

The curative serum previously mentioned in this series of reports is still available, and is of considerable value in saving the lives of horses if administered early in the disease. It is also useful in producing a passive immunity of short duration in exposed horses, and its use in this manner is recommended under certain conditions such as when horses are to be sent to fairs, horse shows or race meets. As previously predicted, research has led to the development of preventive vaccines for use against this disease, which may now be purchased from commercial laboratories, and are suitable for use for routine immunization before the beginning of the seasonal period of the disease. A virus vaccine to be used simultaneously with serum, for use after the disease has appeared, is also available from the research laboratory of the University of Nevada. Immunization by this means is intended for use on ranches where cases have already appeared on adjacent ranches, and otherwise, whenever infection appears imminent. This form of vaccination may be expected to confer, in a very short time, an immunity which will last for the remainder of the season.

The determination of a definite policy for the control of encephalomyelitis is difficult. Because of the fact that it is impossible to foresee where the disease will appear during any season, it would seem that widespread vaccination against the disease would hardly be justified. The appearance of the disease in epizootic proportions in any district one year is more likely to be an indication that this area will be free of the disease the following year than that it will again occur. In these areas, however, a few cases may be expected in colts and in horses brought in from other districts, which have not had an opportunity to develop immunity from exposure. In all sections there are doubtlessly a few spontaneous recoveries of mild cases.

After consideration of the history of brain fever in Nevada, it would appear perhaps to be a wise policy to assume that a considerable number of the horses in the State have developed a certain degree of immunity from exposure and that certain areas will be comparatively free of the disease during the next few years. For those stockmen who desire to avail themselves of the protection for their horses to be obtained from the use of vaccines from commercial laboratories outlined above, there is no reason to believe that such routine vaccination performed in the spring, well in advance of the brain fever season, will not be a reasonable assurance of freedom from the disease.

For those who prefer to await the possible appearance of the disease, the method of treatment and immunization with serum and a combination of serum and virus vaccine previously referred to will probably be a satisfactory means of control.

During the past biennium properly authenticated cases of encephalomyelitis have occurred in Clark, Churchill, Douglas, Elko, Humboldt, Lander, Lyon, Ormsby, Pershing, and Washoe Counties in Nevada.

BACILLARY HEMOGLOBINURIA

Losses from this disease, commonly called red water, continue, although the disease is quite generally understood by stockmen.

A preventive vaccine is available from commercial laboratories, but is probably not used as generally as the incidence of the disease would indicate the necessity for. There is also a tendency to depend upon this vaccine, when used, to confer an immunity for a longer period than it actually does, and more frequent vaccination would doubtlessly prevent losses from the disease.

Commercial laboratories have discontinued the production of curative serum for this disease as the use of this serum, while successful in curing sick animals, if given early in the disease, is limited mostly to dairy animals, where the disease may be easily recognized, and it is not in great demand.

In order that this serum may be available to Nevada stockmen, however, the Department of Veterinary Science of the University of Nevada, where this serum was originally produced, has resumed its production, and it is now available from that source.

HOG CHOLERA

Losses of swine from cholera have been comparatively small during the last two years, and no changes in the method of controlling this disease are contemplated. The comparative freedom of the State from this disease has apparently justified the policy established some time ago of restricting vaccination strictly to necessary conditions, and depending upon sanitation and quarantine to control the disease. Routine immunization is permitted in garbage-feeding plants, and is occasionally necessary elsewhere. Feeding plants where vaccination is followed are kept under permanent quarantine, and all hogs vaccinated elsewhere as well as the premises on which they are kept, are quarantined for at least thirty days, and hogs found to be infected with cholera are quarantined and the infected premises are kept under quarantine for at least sixty days.

ANTHRAX

Almost universal vaccination, in previously determined areas of infection, has continued to keep the State comparatively free of anthrax.

In the summer of 1937 there were some losses from this disease in Churchill County. An epidemic developed on the grazing lands of the Carson Sink section, an area of historical virulent infection. Although vaccination is customary in this district, considerable numbers of cattle were left unvaccinated for economic and other reasons, or were inocculated with vaccine of a type unsuitable for that section.

In other sections of the county, cases appeared here and there but did not involve groups of animals. It was noted that the disease persisted beyond the usual anthrax season, and that it attacked horses as well as cattle, indicating that carcasses of cattle dead of anthrax were not being properly disposed of in areas where large losses occurred. As a matter of livestock disease control, as well as in the interest of the public health, it will be necessary in the future to more rigidly

enforce the regulations pertaining to this phase of anthrax prevention and control.

This disease did not appear, during this biennium, in any new sections and only a limited number of cases developed in doubtful areas where widespread vaccination is not practiced. It has been noted that cattle brought into anthrax infected areas from sections where anthrax does not occur are more susceptible to the disease than native cattle which have probably developed some degree of immunity from exposure or retained some immunity from previous vaccination, and that it is more difficult to establish immunity in such imported cattle by vaccination.

Following a long period in which veterinarians and stockmen have felt the need of, and hoped for the development of, a reliable single dose immunizing agent for the protection of cattle from anthrax, such a product is at last available, and has been used successfully during the latter part of the period covered by this report.

Vaccine of this type is prepared for use in small doses and is adaptable to rapid clean-cut administration. There is less delay, inconvenience, and expense in handling cattle for immunization, and the actual cost of the biological product itself is considerable less than that of other products in use in the past.

This form of vaccine should be universally used for routine immunization in the spring in all sections where there is reason to believe that anthrax may occur. It is not suitable for use late in the season or after an outbreak of anthrax has started, dependence in such cases still being placed on the simultaneous use of highly virulant anthrax vaccine and serum.

There is apparently no longer any reason for livestock owners to suffer more than minor losses from anthrax, and it is believed that losses will be reduced to a minimum in the coming years.

RABIES

Notwithstanding the increase in the incidence of rabies in many sections of the United States, the State of Nevada has remained free of the disease with the possible exception of one case in a coyote not confirmed by laboratory examination. Considerable alarm has been caused elsewhere, however, and several States have adopted special quarantine regulations pertaining to the interstate movement of dogs. No restrictions on the transportation of dogs have been adopted for Nevada as yet, and probably will not be unless there are unfavorable developments in the rabies situation elsewhere.

TUBERCULOSIS

The entire State of Nevada is a Modified Tuberculosis-Free Accredited Area, the last county having been placed in that status March 1, 1933.

Tuberculin testing is no longer a major activity, although routine testing necessary to maintain the accreditation of the State is conducted through the cooperation of the Bureau of Animal Industry of the United States Department of Agriculture, and special testing, in the interest of the public, is done in order that the dairies supplying our cities may be kept free of tuberculosis.

Every effort will be made to avoid losing the ground previously gained in tuberculosis eradication, and careful supervision of the importation of cattle into the State will be continued.

Statistical data follow:

County	Declared modified, tuberculosis-free area	Reaccredited	Expiration date
Churchill	February 1, 1931	July 1, 1935	July 1, 1938
Clark	March 1, 1932	April 1, 1936	April 1, 1939
Douglas	March 1, 1930	July 1, 1936	July 1, 1939
Elko	March 1, 1933	July 1, 1936	July 1, 1939
Esmeralda	May 2, 1932	March 1, 1936	March 1, 1939
Eureka	March 1, 1933	July 1, 1936	July 1, 1939
Humboldt	February 1, 1932	March 1, 1936	March 1, 1939
Lander	May 2, 1932	March 1, 1936	March 1, 1939
Lincoln	May 2, 1932	April 1, 1936	April 1, 1939
Lyon	March 1, 1930	July 1, 1937	July 1, 1940
Mineral	February 1, 1931	July 1, 1937	July 1, 1940
Nye	May 2, 1932	April 1, 1936	April 1, 1939
Ormsby	March 1, 1930	December 1, 1936	December 1, 1939
Pershing	May 1, 1931	July 1, 1935	July 1, 1938
Storey	February 1, 1931	July 1, 1937	July 1, 1940
Washoe	May 1, 1931	July 1, 1936	July 1, 1939
White Pine	May 2, 1932	March 1, 1936	March 1, 1939

A summary by years since the work was started in 1919, of cattle tested and reactors found, shows the following:

Year	Cattle tested	Reactors	Percentage of reactors
1919	5,520	467	8.45
1920	12,475	427	3.42
1921	10,420	313	3.00
1922	11,127	287	2.56
1923	15,419	183	1.18
1924	16,812	103	.61
1925	11,441	149	1.30
1926	12,853	96	.74
1927	17,532	117	.60
1928	20,435	224	1.70
1929	30,425	97	.31
1930	33,950	95	.28
1931	13,099	21	.16
1932	23,825	32	.13
1933	23,179	55	.24
1934	6,915	37	.52
1935	34,603	80	.23
1936	31,957	38	.12
1937	14,640	12	.09
1938 (January 1 to June 30)	7,495	4	.05

BANG'S DISEASE

The control of Bang's disease through blood testing of cattle has been the most important cooperative activity of this division with the United States Bureau of Animal Industry during the past biennium. The cattle-testing program, originally confined to dairy herds, has expanded until beef and range cattle are being tested in considerable numbers.

The Congress of the United States has appropriated sufficient funds to assure the continuation of Bang's disease control, and it is becoming apparent that Federal and State livestock sanitary officials are definitely committed to a program of testing, and elimination of infection, leading to the ultimate eradication of Bang's disease.

Heretofore only a small number of States, not including Nevada, have participated in indemnity payments to owners for cattle slaughtered, after having been found to be infected with this disease.

In passing the last appropriation of Federal funds for this purpose, however, Congress provided that on and after May 1, 1939, no Federal indemnity payments shall be made on reactors to Bang's disease tests unless an amount equal or greater than the amount paid by the United States is paid by the cooperating State. Several States have already made appropriations varying from $11,000 to $400,000 for this purpose, and unless the Nevada Legislature makes such an appropriation at the next session it now appears unlikely that any Federal indemnity funds will be available in Nevada after the above date for the continuation of Bang's disease eradication.

Several years before assistance in Bang's disease control was available from the Federal Government the State Board of Stock Commissioners of Nevada developed a system of Bang's disease testing and voluntary removal of reacting cattle leading to the certification of such free herds as Bang's Disease Free Accredited Areas.

The State Department of Agriculture has not yet adopted regulations requiring that cattle originate in Bang's disease free herds or pass a negative test for this disease for entry into Nevada, but it is believed that sufficient progress has been made in eradicating the disease within the State to justify the adoption of such regulations during the next biennium.

Statistical data follows:

BANG'S DISEASE TESTS—STATE PLAN

Counties	Accredited		In Process of Accreditation	
	Herds	Animals	Herds	Animals
Churchill	4	304		
Clark	17	402	9	202
Douglas	7	240		
Lyon	1	19		
Ormsby	2	93	1	80
Washoe	2	202		
Totals	33	1,260	10	282

FEDERAL–STATE BANG'S DISEASE TESTS, INDEMNITIES, ETC. 1934–1938

Counties	FIRST TEST					SECOND TEST					THIRD TEST				
		Animals					Animals					Animals			
	Herds involved	Negative	Suspect	Reactors	Herds having reactors	Herds involved	Negative	Suspect	Reactors	Herds having reactors	Herds involved	Negative	Suspect	Reactors	Herds having reactors
Churchill*	172	2,414	189	507	75	94	1,478	84	67	26	49	795	73	25	9
Clark	263	1,578	93	96	17	146	1,195	43	9	3	37	663	38	10	3
Douglas	61	3,515	157	633	36	40	1,209	72	43	14	22	778	45	36	8
Elko	28	7,699	551	2,119	21	15	2,584	100	532	6	4	140	9	7	2
Eureka	10	407	27	101	8	3	117	11	5	1	2	91	5	1	1
Humboldt	2	842	29	153	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lander	4	771	37	101	3	3	727	20	18	2	2	522	64	76	2
Lincoln	125	682	22	8	4	77	446	12	8	2	3	47	1	.....	.....
Lyon†	114	2,329	141	303	53	61	1,486	59	58	15	29	629	47	15	6
Mineral	2	56	.....	3	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nye	3	51	2	5	1	1	31	.....	.....	.....	.....	.....	.....	.....	.....
Ormsby	19	589	60	84	6	7	386	32	9	2	5	295	14	9	3
Pershing	1	55	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Storey	1	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Washoe	227	5,491	422	697	92	112	3,842	217	141	35	57	2,723	112	83	17
White Pine	110	1,250	100	176	42	51	831	48	48	17	22	566	47	20	7
Fort McDermitt Sub-Agency McDermitt, Nevada	55	603	13	77	30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fallon Sub-Agency Stillwater, Nevada	21	121	7	5	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Walker River Indian Reservation Schurz, Nevada	76	1,200	39	21	13	56	761	17	24	16	48	1,027	40	8	7
Yomba Indian Reservation Austin, Nevada	6	120	2	2	1	3	79	.....	.....	.....	.....	.....	.....	.....	.....
Pyramid Lake Indian Reservation Nixon, Nevada	77	907	70	42	24	49	715	6	8	6	.....	.....	.....	.....	.....
Western Shoshone Indian Reservation Owyhee, Nevada	311	1,974	136	339	158	224	1,281	81	186	82	137	1,257	50	136	60
Totals	1,688	32,660	2,099	5,472	590	942	17,168	802	1,156	227	417	9,533	545	426	125

*Two herds—Experimental calf vaccination. †Three herds—Experimental calf vaccination.

Counties	FOURTH TEST					FIFTH TEST					SIXTH TEST				
		ANIMALS					ANIMALS					ANIMALS			
	Herds involved	Negative	Suspect	Reactors	Herds having reactors	Herds involved	Negative	Suspect	Reactors	Herds having reactors	Herds involved	Negative	Suspect	Reactors	Herds having reactors
Churchill*	27	438	60	9	4	9	152	5	5	3	2	26	1	.....	.....
Clark	15	471	24	1	1	3	194	10	2	1	1	85	4	.....	.....
Douglas	9	381	8	24	3	5	185	18	6	2	5	176	7	3	2
Elko	1	26	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Eureka	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Humboldt	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lander	2	620	7	15	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lincoln	1	27	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lyon†	12	240	18	6	3	4	144	1	1	1	2	67	1	1	1
Mineral	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nye	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ormsby	4	93	13	3	1	4	152	10	9	3	3	101	6	10	2
Pershing	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Storey	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Washoe	27	1,544	118	107	9	9	315	19	6	3	6	239	22	3	2
White Pine	10	358	12	7	5	4	268	21	6	2	.....	.....	.....	.....	.....
Fort McDermitt Sub-Agency McDermitt, Nevada	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fallon Sub-Agency Stillwater, Nevada	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Walker River Indian Reservation Schurz, Nevada	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Yomba Indian Reservation Austin, Nevada	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pyramid Lake Indian Reservation Nixon, Nevada	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Western Shoshone Indian Reservation Owyhee, Nevada	6	93	3	3	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals	114	4,291	268	175	30	38	1,410	84	35	15	19	694	41	17	7

*Two herds—Experimental calf vaccination. †Three herds—Experimental calf vaccination.

BANG'S DISEASE TESTS—*Continued*

Counties	SEVENTH TEST					EIGHTH TEST					ADDITIONAL RETESTS					Salvage	United States indemnity
	Herds involved	Animals: Negative	Animals: Suspect	Animals: Reactors	Herds having reactors	Herds involved	Animals: Negative	Animals: Suspect	Animals: Reactors	Herds having reactors	Herds involved	Animals: Negative	Animals: Suspect	Animals: Reactors	Herds having reactors		
Churchill*	1	15	....	....	....	....	....	....	....	....	....	....	....	....	....	$15,181.88	$12,478.45
Clark	1	81	3	....	....	....	....	....	....	....	....	....	....	....	....	3,388.85	2,357.92
Douglas	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	28,814.09	15,866.71
Elko	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	46,763.31	50,250.73
Eureka	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2,647.91	2,388.08
Humboldt	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3,393.78	3,778.34
Lander	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5,434.87	4,501.48
Lincoln	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	186.05	206.00
Lyon†	1	66	....	....	....	....	....	....	....	....	....	....	....	....	....	10,872.31	8,032.39
Mineral	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	70.50	63.50
Nye	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	100.00	125.00
Ormsby	1	25	....	1	1	1	81	....	2	1	1	18	4	1	1	4,623.25	2,373.00
Washoe	3	113	4	1	1	1	32	....	....	....	....	....	....	....	....	26,622.85	18,228.34
White Pine	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6,716.56	5,317.28
Fort McDermitt Sub-Agency McDermitt, Nevada	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1,606.62	1,721.61
Fallon Sub-Agency Stillwater, Nevada	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	160.00	150.00
Walker River Indian Reservation Schurz, Nevada	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	846.50	1,082.50
Yomba Indian Reservation Austin, Nevada	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	40.00	40.00
Pyramid Lake Indian Reservation Nixon, Nevada	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1,166.00	1,117.00
Western Shoshone Indian Reservation Owyhee, Nevada	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	17,569.26	13,184.94
Totals	7	300	7	2	2	2	113	....	2	1	1	18	4	1	1	$176,204.59	$143,263.27

*Two herds—Experimental calf vaccination. †Three herds—Experimental calf vaccination.

SUMMARY OF LIVESTOCK DISEASE CONTROL WORK PERFORMED IN THE STATE BY THE UNITED STATES BUREAU OF ANIMAL INDUSTRY, STATE DEPARTMENT OF AGRICULTURE AND ACCREDITED VETERINARIANS COOPERATING FOR THE PERIOD JULY 1, 1936, TO JUNE 30, 1938.

Miscellaneous field investigations	403	
Autopsies, including reactors to tuberculin tests	126	head
Scabies control work—		
Routine cattle inspections	103,138	head
First dippings	3,512	head
Second dippings	1,965	head

Immunization and Treatment by the Use of Biologic Products

Actinomycosis, cattle	4	head
Anthrax, cattle	1,267	head
Anti botulinus, horses	5	head
Bacillary hemoglobinuria, cattle	18	head
Encephalomyelitis, horses	533	head
Hemorrhagic septicemia, hogs	348	head
Hog cholera, 151 herds	4,297	head
Mastitis, cattle	32	head
Karatitis, cattle	105	head

Biologic Tests Applied in the Field

Johne's disease tests, cattle	1	head
Tuberculosis, Avian, chickens	24	head
Tuberculin tests of cattle—		
Total animals tested	29,608	head
Total herds involved	1,271	
Total reactors found	20	head
Total herds showing reactors	14	

Blood Specimens Collected for Laboratory Examination

Bang's disease—Cattle—		
First test	22,829	head
Second test	8,667	head
Third test	7,679	head
Fourth test	4,237	head
Fifth test	1,156	head
Sixth test	688	head
Seventh test	294	head
Eighth test	210	head
Ninth test	24	head
Tenth test	168	head
Twelfth test	21	head
Thirteenth test	23	head
Calf vaccination	227	head
Special	703	head
For reaccreditation	2,143	head
Total animals tested	49,069	head
Total reactors found	4,819	head
Brucellosis—		
Goats	91	head
Hogs	12	head
Dourine—Horses—		
Negative	878	head
Dourine	3	head
Glanders—Horses—		
Negative	15	head

INTERSTATE MOVEMENTS OF LIVESTOCK

July 1, 1936, to June 30, 1938

Shipments OUT of Nevada, including only movements covered by official health certificates, and do not include cattle feeding in transit:

Cattle	2,370 head
Horses shipped for immediate slaughter	319 head
Horses shipped for purposes other than slaughter	2,145 head
Mixed lots of animals for exhibition	859 head
Shipments from Brand Inspection Districts of Clark and Lincoln Counties—As shown on inspector's reports—	
Cattle	4,305 head
Horses, mules, etc.	359 head
Total animals outbound	10,357 head
Inspected by Department on behalf of Sheep Commission—	
Sheep outbound	3,180 head

Shipments INTO Nevada, including animals entering legally on health certificates or permits. Several thousand head of cattle were moved into Nevada from Montana during the drought period of 1936; of these a considerable portion are to remain in Nevada, their owners now making their home in this State. These figures are approximate as carload lots are counted as 30 head to the car. It is understood that occasional shipments arrive in the State without permit or health certificate, moving by truck or being trailed. In all cases effort is made to have a record of all dairy or breeding cattle arriving in Nevada:

Cattle entering on health certificates or permits, not including cattle on permits for immediate slaughter*	30,353 head
Cattle entering on permits for immediate slaughter	3,970 head
Horses entering on health certificates	126 head
Total animals inbound	34,449 head

*Cattle and horses entering the State for rodeo and exhibition purposes not included.

QUARANTINE REGULATIONS

Regulations governing the importation of livestock into Nevada adopted years ago have remained in force during the past biennium. It is anticipated, however, that during the next two years certain modifications necessary to meet changing conditions will be made.

The entire United States, with the exception of portions of California is now modified tuberculosis free accredited area and regulations necessary to protect the livestock of the State from this disease are therefore less restrictive. On the other hand, the widespread activity in Bang's disease control obviously makes it necessary to restrict the movement of cattle infected with or not tested for this disease. It is now believed that sufficient progress has been made in Bang's disease eradication within the State to justify the requirement that only cattle free of this disease be admitted, and it is probable that regulations leading to this end will be adopted during the coming biennium. Movement of cattle within the State may also be restricted in case certain counties are declared Bang's disease free eradicated areas. Accredited herds are protected by the signed agreement between the owner and the State Department of Agriculture.

Certain areas in northeastern Nevada remain under quarantine on account of dourine of horses, and the regulation of the State of California requiring that all mares and stallions pass a negative blood test for dourine for movement from Nevada into California is still in effect.

A number of hog-feeding plants, where immunization against hog cholera is practiced, have been kept under quarantine and a limited number of ranchers have been quarantined for short periods on account of outbreaks of this disease.

No legal proceedings have been necessary in the enforcement of veterinary police measures or quarantine during this biennium.

ACKNOWLEDGMENTS

The Division of Animal Industry expresses its appreciation of the assistance received from all groups and organizations cooperating in its activities.

The Bureau of Animal Industry, United States Department of Agriculture, has continued to remain in position to render noteworthy assistance to the livestock industry of Nevada in connection with Bang's disease control and the progress made would not have been possible without this financial assistance in the payment of indemnities and the employment of personnel.

This bureau has also continued to detail veterinarians for conducting such tuberculin testing as is necessary for maintaining the status of Nevada as a modified tuberculosis free accredited area and has paid a share of the indemnity money for cattle condemned for tuberculosis.

To Dr. R. A. Given, Inspector in Charge, Bureau of Animal Industry, United States Department of Agriculture, in Nevada, thanks is expressed for the cooperation extended at all times, and this division expresses its appreciation of the capable manner in which he and the members of his staff have handled their duties.

The Farm Bureau dairy and livestock groups and various officials have at all times given their cooperation and assistance.

The Nevada State Cattle Association has kept in touch with this division and such cooperation as is possible between these two organizations has been maintained.

A large number of State and county officials, too numerous to refer to individually, have been of invaluable assistance to this division during the past biennium, and appreciation is expressed to all of them.

DIVISION OF PLANT INDUSTRY

GEORGE G. SCHWEIS, *Director*

The Division of Plant Industry functioned very actively during the past biennium, as in addition to the regular work some unexpected emergencies arose during this period. The Federal Government through the Agricultural Adjustment Administration and the Federal Surplus Commodities Corporation, asked that the State cooperate with these agencies in carrying into effect their program of marketing surplus Nevada potatoes. Further, the Federal Bureau of Entomology and Plant Quarantine entered into an agreement with the State Department of Agriculture whereby cooperative work projects were to be carried on for the control of Mormon crickets and grasshoppers. Much time was spent by the personnel of the division in weed control problems, both in field work and in conference with other agencies and individuals in furthering the program.

A summary of the operations of the various activities follows:

QUARANTINES

No new quarantines were placed in effect during the biennium, although the quarantine on account of the Oriental fruit moth was revised and reissued during 1937. This became necessary as additional eastern States had become infested during the interim since the original quarantine was issued.

Following are the quarantines now in effect in Nevada:

Colorado Potato Beetle Quarantine, which has been in effect for a number of years and is being enforced owing to the fact that only two States in the Union are now free of this insect pest. They are California and Nevada. In States where this insect has become established, the cost of raising potatoes is materially increased, as for satisfactory control it is necessary to spray the potato plants with an arsenical spray or resort to hand picking.

Oriental Fruit Moth Quarantine, which was recently revised and reissued, embargoes certain fruits, containers and nursery stock from States infested with this pest. This quarantine is strictly maintained, as none of the eleven Western States is infested with this insect and no satisfactory method of control has been found. The Nevada quarantine is uniform with those of the other States still free of this insect.

European Corn Borer Quarantine, which was placed in effect in 1932, has been continued to protect the agricultural crops of Nevada from the ravages of this insect pest, which attacks not only corn and related crops, but also chrysanthemums, asters, dahlias, and gladiolas, as well as several of the garden vegetables.

Alfalfa Weevil Quarantine, which has been amended from time to time as additional counties in the State have become infested with this insect, until now the entire State is considered infested territory with the exception of Clark County and portions of Nye and Esmeralda Counties. Whether it is advisable to continue this quarantine

is debatable, as the economic benefits that would accrue from its raising might offset any damage that could result if the alfalfa weevil were to become established in these counties. The question also arises whether the weevil would survive in the counties in question, as doubtless the weevil has been carried into this area many times in the past. From knowledge now at hand, it seems as though the territory in which weevils will thrive is going to be limited by climatic or cropping practices which interfere with a completion of the life cycle.

Honey Bee Quarantine, which restricts the importation of bees into Nevada on combs and used apiary equipment, is considered necessary to prevent the introduction of bee diseases. Nevada has had a stringent apiary inspection law in effect for a number of years and much progress has been made in controlling bee diseases. Considerable sums of money have been spent in keeping disease under control, and until such time as surrounding States have satisfactory inspection departments, Nevada feels justified in maintaining this quarantine.

This department is now assembling information on the life histories and habits of two insects that have become established in California, and if the data gathered leads us to believe that they will be injurious to Nevada's agriculture, quarantines will be promulgated that will protect this State from the possible introduction of these pests.

INSECT PESTS

The control of insect pests has continued to be of utmost importance to the agricultural interests of the State during the past two years. The major projects of economic importance carried on during this period have been for the control of Mormon crickets and grasshoppers. Termites also have become more and more prevalent in western Nevada, and during the biennium many calls have been received for information and assistance in combating this destructive insect. Following are brief detailed reports on the above, with some mention of insects of more minor importance:

Mormon Crickets. Mormon cricket control in 1936, which was handled cooperatively between the State Department of Agriculture and the WPA, proved more effective than had been expected. Cultivated crops with few exceptions were saved and cities and water supplies, although threatened, were protected with one exception. From an egg survey made later in the season, a heavy infestation was predicted in various areas for 1937, provided normal hatching conditions prevailed.

Early in 1937 it was found that the predictions from the egg survey of 1936 proved true, and a control project again became necessary. This project was handled entirely by the WPA, with good success, and gave the personnel of the State Department of Agriculture a timely and desired opportunity for studying the life history and habits of the crickets in their native surroundings, and to experiment with the use of poison baits, new dust mixtures, and airplane dusting as means of control.

Various baits used gave good results under pen conditions; however, as they were not tried on extensive field infestations, their use cannot be recommended pending further study.

New commercial dust mixtures consisting principally of sulphurs and calcium arsenate gave very satisfactory results. The most impressive advantages over locally mixed dusts were the uniform mix possible, uniform coverage obtained, and the elimination of the danger involved in handling straight arsenic at the mixing plants. The principal disadvantages is the cost which is from one-half to double as much as for locally mixed lime and sodium arsenite.

A very extensive experiment was conducted with the use of an airplane for dusting adult crickets. The experiment was carried on through the period of May 27 to June 26, 1937. Very satisfactory results were obtained, both with the old sodium arsenite lime mix and with sulphur and calcium arsenate mixtures. The speed with which the material was applied, together with the uniformity pounds per acre, demonstrated the essential advantages of plane dusting over hand dusting, the application cost being reduced from $1.37½ to $0.36 per acre. In addition, danger to livestock was eliminated by the uniform coverage.

Adult and egg surveys were conducted between June 23 and August 12, 1937, in seven counties. Results of these surveys indicated that the 1938 infestation would probably cover a larger area with somewhat lighter concentrations in certain areas adequately patrolled for the past three years, and heavier concentrations in certain other areas where control crews did not work or where they were too small to handle the situation in 1937.

Observations made early in 1938 proved the 1937 adult and egg surveys to be reasonably accurate.

An entirely new setup for control was used, with the Federal Bureau of Entomology and Plant Quarantine entering into a cooperative agreement with the State Department of Agriculture and the counties of Elko, Humboldt, and Pershing.

The bureau supplied labor, supervision, and some material, with the State supplying all other material, office costs, and a portion of the State Supervisor's expense. Counties in which work was done supplied transportation for the crews.

Nevada's Federal allotment was cut about twenty-five percent from the original estimate submitted by the State Department of Agriculture as required for the year. The program was drawn on a four-month basis, averaging 120 men per month. The first control crew was organized on April 25, 1938, and by June 30, 1938, 17 crews were in operation over the infested area.

As estimated, 465,800 acres of pasture, hay, and cultivated crops were expected to be protected by control work. Although Nevada's range is the best in years, damage to the range is heavy, with feed in many areas being 90 to 100 percent destroyed. The infested range lands as a whole show an average damage of about 27 to 30 percent.

Grasshoppers. As predicted from an egg survey made in the fall of 1936, grasshoppers again presented some threat to agricultural crops early in 1937, and limited control work was carried on in Humboldt, Washoe, Douglas, and Lyon Counties. Poison bait material for this

work was the remainder of the Federal supply left over from the previous season and on storage in the various counties. The early infestation seemed light, and no serious damage was anticipated; however, toward the end of the season, due to a continuous hatching over the summer, a more serious condition developed. This occurred after control work had ended, and due to the lateness of the season further control work did not appear practicable. A limited egg survey was conducted over the areas in which infestations were known to be present or had been present in previous years. This survey indicated that severe infestations might be expected to appear in Douglas, Washoe, Lander, Humboldt, and possibly Churchill Counties in 1938.

In the late spring of 1938 a serious grasshopper condition became evident in Washoe, Douglas, Lyon, Churchill, Humboldt, Lander, and Eureka Counties. A cooperative project, in which the State Department of Agriculture, the Federal Bureau of Entomology and Plant Quarantine and the counties concerned participated, was inaugurated under the direction of a State supervisor, who was Federally paid; other supervision being volunteer or county paid. Poison bait materials were supplied by the Federal Government.

As this project is only well under way at the close of the biennium, it is not possible now to say how serious the infestation may become or what losses will occur, or to give a definite forecast as to what may be expected in 1939, but from the number of adult hoppers that are present this early in the season in the western and central counties, it can be anticipated that serious losses would occur later in 1938, and that during 1939 there will be a serious hatch of grasshoppers in the agricultural areas of the State now involved.

Termites. Termites, which have caused widespread damage in States having a more humid climate than Nevada, are apparently increasing rapidly in this State, and particularly in the city of Reno. What has brought about this condition is not definitely known, but we suspect that modern heating devices which keep the basement and adjoining ground warm during the winter months afford an opportunity for the termite to be active over a twelve-month period have some bearing on this problem. Over fifty premises were examined during the biennium, and in some instances termites have caused sufficient damage to necessitate repairs running into hundreds of dollars.

Alfalfa Weevil. Alfalfa weevils, which have been established in Nevada for a great many years, have been of some economic importance during the past biennium. It has been necessary to conduct some control work in Washoe County where a considerable acreage was dusted by airplane. Results obtained were fairly satisfactory. Our attention was called to alfalfa injury in Elko and Douglas Counties in 1937, and an investigation revealed that the plants in these two counties were being severely damaged by weevil. The department recommended to the growers involved in this outbreak that control measures be instituted either by dusting or else by early cutting, where such an agricultural practice was feasible. Nothing was done during the biennium by the growers in these two sections, and severe losses

resulted to the first crop of alfalfa. It is to be hoped that the growers will recognize the severity of this situation and institute control measures during 1939, as the quality of hay produced from fields badly injured by the alfalfa weevil is materially lessened.

A survey conducted by the Federal Bureau of Entomology and Plant Quarantine to determine whether alfalfa weevils were present in Clark County was made both during 1937 and 1938. No weevils were found in this county, and California modified its quarantine so that products from Clark County may again enter the State of California without restriction.

Many additional calls were received for information as to the control of other insect pests, such as the black widow spider, insects of the household, and those affecting garden crops, flowers, and shrubbery.

ALFALFA HAY AND MEAL SHIPMENTS

Alfalfa hay and meal continued to be the major agricultural products moving in interstate commerce. Revisions in the California alfalfa weevil quarantine, which opened coast markets, and a shortage of livestock feed in several California counties resulted in the shipment from Nevada of many hundred cars of hay which moved in specially sealed cars under permit.

In addition to already established alfalfa meal mills in Nevada, several portable mills moved into the State from California for the manufacture of alfalfa meal during a limited period. These mills were so constructed as to meet the California quarantine requirements for certified alfalfa meal mills and operated for short periods in alfalfa-producing areas, the product being produced and shipped to meet the trade needs of the owners.

During the biennium 2,416 carloads and 99 trucks and trailers of hay moved out of the State under permit, and 89,409 sacks of alfalfa meal from certified mills. In addition a large quantity of hay and meal moved by truck into bordering California counties without permit.

PLANT DISEASES AND IDENTIFICATION

Many specimens of diseased plants for diagnosis have been received from all parts of the State. The summer of 1938 was unusually favorable to the development of plant diseases. The common but usually less destructive diseases, such as rust, ergot, smuts and mildews were abundant and unusually destructive during this season. This was particularly true of rust on wheat and mildew on alfalfa. A disease which apparently has become established in the State and which results in much loss to farmers is bacterial wilt of alfalfa. Specimens of diseased alfalfa plants were received from several sections of the State in 1937 and diagnosed as alfalfa bacterial wilt. Specimens were sent to the Plant Disease Survey at Washington, D. C., where confirmation by specialists was made. A field representative of the Extension Office of Plant Diseases in Washington visited the State and, with the writer, visited areas in the Truckee Meadows where this disease has apparently become established.

The most characteristic sign of alfalfa wilt is dwarfed plants with slender stems and small leaves, somewhat yellow in color. An examination of the tap root shows a yellow discoloration of the outer part of the wood.

Alfalfa wilt has been sent to our laboratories for diagnosis from the Fallon, Lovelock, and Fernley sections during the past year.

NOXIOUS WEEDS

The control of noxious weeds continues to be one of the major problems affecting agriculture in the State. Repeated attempts by the Western Plant Quarantine Board, the State Department of Agriculture, the State Farm Bureau, and the State Planning Board to interest the Federal Government in a noxious weed control program have to date failed, but the efforts of these interested agencies continues unabated. It is to be hoped that eventually favorable consideration will be given to the proposal for a cooperative agreement between the Federal Government and the State for the control of weed pests. The counties and the State continue to press the weed-control program wherever funds are available, and at this date active work is being carried on in Douglas, Churchill, and Washoe Counties, and to a lesser degree in some of the other counties.

If it were not for the inspection work carried on by the State Department of Agriculture, puncture vine, an extremely noxious weed, would now be one of our major problems, as each year several new infestations are discovered and eradicated in all of the western and central counties. That this work is successful is borne out by the conditions in the city of Reno and vicinity, where, since its first discovery, 142 properties became infested with puncture vine, but by prompt action all of the infestations have either been eradicated or placed under control. Similar practices are followed in other towns and counties whenever the weed has been found.

Camel's thorn (*Alhagi camelorum*, Fisch) a troublesome weed in California, was discovered in Churchill County by a scout of this department in 1936. Recognizing the seriousness of this weed pest if allowed to spread to other lands, an agreement was reached whereby the Board of County Commissioners, cooperating with the District Water Board, instituted control measures under the State Department of Agriculture. This work has now been carried out for two seasons, and the weed has not escaped from the plot of ground originally infested. This work will be carried on until complete eradication is obtained, as repeated scouting has failed to reveal any further infestations.

The first annual conference of the Western Weed Committee was held at Denver in June of 1938. This committee is an offshoot of the Western Plant Quarantine Board and was organized to deal exclusively with matters pertaining to the control of noxious weeds. This subject formerly was considered by the entire membership of the Western Plant Quarantine Board, but as some of the members of this organization were not authorized to deal in weed-control matters, and

hence were not interested, it was decided that weed-control projects could be given more consideration if handled separately.

Among the resolutions passed at the Denver meeting which may prove of benefit to Nevada is the one dealing with the use of CCC camp labor on weed-control projects. The resolution as passed, is as follows:

> WHEREAS, The rapid and general spread of noxious weeds and damage and consequent losses caused by them has become a serious problem in the agriculture of the western United States; and
>
> WHEREAS, The spread of these weeds includes National Forest, public domain, Indian lands, as well as private land, including the western irrigation projects, and since each contributes seed and root spread to adjacent lands; and
>
> WHEREAS, Recognizing that the weed control problem is so large as to no longer be a private problem but a public problem; and
>
> WHEREAS, That the Federal Government is making available CCC camps to various Federal agencies to work on public programs concerned with these agencies on public lands, and recognizing that the research department of the Federal Bureau of Plant Industry and various experimental stations have demonstrated control and eradication methods that can be used by CCC camps; therefore, be it
>
> *Resolved*, (1) To ask that weed control be accepted as a public problem; (2) that CCC rules and regulations be so changed to make it possible for CCC labor to war against the further spread and to eradicate as far as possible noxious weeds wherever found in the western United States, on or adjacent to Federally owned or controlled land.

The Nevada State Planning Board also recognized the seriousness of the weed menace to Nevada's welfare, and at a meeting held June 27, 1938, the following resolution was passed:

> WHEREAS, The continued spread of noxious weeds under the favorable natural conditions existing in the Western States, and particularly in the State of Nevada, is creating an acute economic problem through the destruction of equities in privately owned lands, the elimination of same from State and county tax rolls, and depreciation in value of public lands; and
>
> WHEREAS, The adequate control and eradication of noxious weeds can only be carried out on a coordinated area basis without regard to land ownership; and
>
> WHEREAS, We are advised that the present regulations governing the CCC camps do not permit the personnel to work on privately-owned lands; and
>
> WHEREAS, The personnel of the CCC camps have proven

themselves particularly well adapted to noxious weed-control work; now, therefore, be it

Resolved, That the various Federal agencies responsible for the conduct and operation of the CCC camps be requested to modify said rules and regulations so as to permit the employment of the CCC camp personnel through spike camps of twenty-five (25) men each in properly sponsored and coordinated noxious weed-control projects on an area basis without regard to the ownership of the lands involved, such projects to be conducted in close cooperation with present Federal, State, or county agency concerned, and with private land owners.

Copies of this resolution were sent to the Boards of County Commissioners, the Irrigation Board of the Newlands Project, State Farm Bureau, and to the heads of the CCC camps now operating in Nevada. Copies were also sent to Nevada's congressional delegation with a letter asking their aid in having the rules and regulations now governing CCC labor modified so as to allow its participation in weed-control projects, regardless of land ownership. Our representatives have interested themselves in the matter, but to date very little success has been achieved in this regard.

The Bureau of Reclamation has, however, cooperated with the Directors of the Newlands Project in Churchill County, and preparations are now under way whereby a tract of land several thousand acres in extent will be dyked and flooded during the fall of 1938 and early in 1939. This land is used as a community pasture by the farmers of the Fallon district, and is heavily infested with white top, and as cattle grazing in this area are taken directly to the farms after feeding on plants containing the mature seed of white top, it is possible that one of the main sources of farm contamination in the Fallon district will be overcome when this area is cleaned.

That eradication is possible in this district by flooding is quite certain, as the soil is a heavy dobe which holds water well, and it has been demonstrated on other projects carried on by the State Department of Agriculture that flooding is a feasible method of control on land of this character. Other tests carried on have proved that flooding is not satisfactory on lands of a sandy or gravelly character, as the water seeps away so rapidly that a complete coverage of the plants is not possible.

AGRICULTURAL SEED CONTROL

The analysis of agricultural seed samples for purity and their testing for germination has been continued for the past two years. A total of 357 samples has been received by the seed laboratory from July 1, 1936, to June 30, 1938. This exceeds the number received the previous years by 36 samples. The increase is accounted for almost entirely by samples submitted by the Soil Conservation Service of the State.

The samples submitted to the laboratory for testing are classified as follows:

GERMINATION AND PURITY TESTS OF SEED SAMPLES

1937–1938 Seasons

Samples	Number	Purity, Percent			Germination, Percent		
		High	Low	Avg.	High	Low	Avg.
Alfalfa	111	100.00	59.06	97.05	99.00	28.75	72.26
Barley	23	99.8	90.65	96.3	100.00	90.7	97.27
Beets	1	100.00	.....	100.00	71.00	.....	71.00
Clover	42	99.9	73.1	97.94	97.7	23.00	74.90
Corn	2	100.00	.....	100.00	100.00	99.5	99.75
Grasses	75	99.9	77.00	95.26	99.00	23.00	71.30
Oats	23	99.8	85.7	95.55	99.5	73.24	92.67
Onions	4	100.00	.....	100.00	98.5	79.00	89.8
Lettuce	2	99.6	99.0	99.3	86.2	77.00	81.63
Rye	5	96.5	91.6	94.53	98.5	85.00	94.30
Spinach	1	99.4	.....	99.45	76.8	.....	76.87
Wheat	60	99.9	91.5	97.85	100.00	89.5	97.23
Miscellaneous forage seeds	8	100.00	90.4	96.59	100.00	36.00	74.38
	357						

Weed seeds found in the above samples were as follows: Barnyard grass, bouncing bet, brome grass, bull thistle, chickweed, cinquefoil, cow cockle, dandelion, darnel, dock, dodder, foxtail, field sorrel, fireweed, gumweed, knapweed, lamb's quarters, lupin, mallow, morning glory, mullein, mustard, peppergrass, pigweed, plantain, polygonum, poverty weed, primrose, Russian thistle, saltbush, saltgrass, sedge, shepherd's purse, smart weed, soapwort, sorrel, sour dock, sunflower, squirrel tail grass, yarrow, yellow melilot, wild rye, and wild grasses.

CERTIFIED SEED

A total of 55½ acres of netted gem potatoes have been certified for seed during the biennium with several applications for later certification on file. This is an increase of over 16 acres as compared with the previous biennium. This increase has been brought about largely through the ready sale of all certified seed potatoes produced in Nevada during 1937. Our records show that the quality of the seed potatoes produced in eastern Nevada is very high, and as western Nevada imports several carloads of seed potatoes each year from other States, there should be a determined effort made to get the growers of commercial potatoes in western Nevada to use Nevada produced seed. The production of certified seed potatoes will be limited to some of the central and eastern counties as nematode is not present in these areas. From Pershing County an application for the certification of 460 acres of White Federation wheat was received. The field has received the necessary field inspections and has met all the requirements for certification. The final inspection of the threashed grain will be made at a later date.

CERTIFICATION OF TOMATO PLANTS AND SUGAR BEET SEED

The certification of tomato plants, field grown in southern Nevada, was continued during the biennium. This industry continues to be a profitable agricultural enterprise for Clark County and the number of plants grown is greater each year. There has been some trouble in disposing of all the seedlings grown during 1938, the tomato acreage in the West having been materially reduced as the canneries had a surplus on hand held over from the 1937 pack.

The growing of sugar-beet seed in Clark and Lincoln Counties continues with about the same acreage in this crop each year. The yield

of seed is good and the quality is very fine. The entire crop of this beet seed is taken each year by the sugar processing interests of Utah and Idaho. In all probability the acreage planted to sugar beets for seed purposes in Clark County will increase as the demand for United States grown seed increases.

CULTIVATION OF SUGAR BEETS

The growing of sugar beets in the Lovelock Valley was started in 1938, when a California concern leased several hundred acres of land for this purpose. The growing of beets on this acreage is at present largely experimental, as the successful growing of this crop has in the past been impossible owing to the susceptibility of sugar beets to a disease known as curly-top. This disease is transmitted to the beets by leaf hoppers which have migrated from wild vegetation, carrying with them the virus of the disease. The disease causes a dwarfing of the leaves with a corresponding shrinkage in the growth of the beets. The plantings in Lovelock this year were of a resistant type of seed developed by the United States Department of Agriculture, and if these beets make a satisfactory growth it has been stated that several thousand acres will be grown in Nevada next year. If this plan is carried out, it will have a decided effect on Nevada Agriculture, as in the past the principal crops grown in this area have been alfalfa and grain.

STANDARDIZATION AND GRADING OF AGRICULTURAL PRODUCTS

Standardization and grading of agricultural products has continued to make rapid advance, and this work is now becoming of more importance to agricultural producers of the State. More States have passed legislation requiring that all products entering therein be marked with their true grade and, in addition, the Federal Agricultural Surplus Commodity Purchasing Corporation is demanding that all fruits and vegetables purchased by them be graded by Federal-State licensed inspectors, and official inspection certificates issued showing the true grade of each lot purchased. As this activity of the Federal Government promises to continue indefinitely, provision should be made to provide additional financial support to carry on the work adequately.

The cooperative agreement between the State Department of Agriculture and the State Apiary Commission was continued during the biennium, and all samples of honey submitted were graded and official grades given. The number of samples offered during the past two years were smaller than during the previous two years, but this was due to the light honey crop. This service has been of great benefit to the honey producers, as practically all honey deals are now made on a cash basis, owing to the dealers being willing to accept the grades given by the State Department of Agriculture as a basis on which to make their purchases.

During 1937 a demand was created for the official grading of hay that was going into interstate traffic, and three inspectors were sent to California for training under a Federal supervisor. These men were schooled for a period of three weeks, and after passing a satisfactory examination were licensed by the Federal Government to act

as hay graders in Nevada. The department now has licensed graders at Lovelock, Fallon, Yerington, and Reno.

Provisions have been made under the Agricultural Adjustment Administration for Government loans to wheat growers who comply with certain regulations issued under the authority of this Act. The wheat on which loans will be made must be sampled and graded by the State Department of Agriculture, the amount of the loan granted being commensurable to the grade of the wheat. This activity will greatly increase the work of the division's personnel and will add considerable expense in the form of travel and subsistence.

Practically all of the Nevada turkeys shipped in interstate commerce during the past biennium were graded by trained and licensed inspectors of the department. A total of 51,681 turkeys weighing 768,078 pounds were shipped during the biennium. Inquiries have been received from dealers regarding the possibility of having all dressed poultry offered for sale in Nevada graded by licensed inspectors, but until funds are made available for such purposes it will be impossbile to start this work.

DISTRIBUTION OF GRADED TURKEYS BY SHIPPING POINTS

Shipping points	1936–1937		1937–1938	
	Birds	Pounds	Birds	Pounds
Fallon	17,041	244,432	12,737	178,360
Lovelock	158	2,557	178	2,467
Moapa Valley	5,027	79,775		
Reno	520	6,852	392	6,009
Yerington	10,380	152,550	5,248	95,076
Totals	33,126	486,166	18,555	281,912

TURKEY PRODUCTION IN NEVADA SINCE 1933

Season	Estimated birds	Production weight	Total birds	Graded weight	Percent graded by birds
1933–1934	42,936	571,879	25,036	344,226	58
1934–1935	34,683	469,787	26,183	360,787	75.5
1935–1936	35,597	482,416	23,731	316,292	66.6
1936–1937	39,126	547,750	33,126	486,166	84.6
1937–1938	27,000	380,000	18,555	281,912	68.7

In addition to the above, the following products moved to outside markets under Federal-State grade certificates:

Onions	20 cars
Potatoes	43 cars
	63 cars

EGG GRADING

Owing to the lack of sufficient funds, the grading of eggs throughout the State, with the exception of Washoe County, continues to remain unsatisfactory. With an annual appropriation of only $600 to enforce this Act, it has been impossible to cover the State in a uniform and efficient manner, and during 1937 an effort was made to have some of the counties enter into an agreement with the State whereby the county would assist financially in paying the salary for inspection service. Owing to the fact that county funds were already budgeted, it was impossible to get the work started at the time.

Washoe County has continued to supply the services of an inspector

on a part-time basis, and as Reno is the commercial center for egg distribution for most of western and central Nevada, the markets have been kept remarkably free of inferior eggs imported from other States. This does not hold true for Las Vegas, Ely, and Elko, however, where most of the eggs sold are sent in either from Utah or Idaho. It is again suggested that the Legislature consider an additional appropriation in order that this needed Act may be adequately enforced.

MEETINGS AND CONFERENCES

Several out-of-State conferences, meetings, and grading schools, at which subjects of importance to Nevada's agriculture were considered, were attended by representatives of the division. The conferences and other meetings covered are as follows:

October 9–19, 1936, the annual turkey-grading school held at Riverside, California.

October 19–24, 1936, a conference of representatives of Intermountain States with representatives of various Federal agencies to consider ways and means for Mormon cricket control, held at Pocatello, Idaho.

October 24, 25, 1936, a meeting of representatives of the Nevada Department of Agriculture with Utah State Department of Agriculture officials to deal with quarantine matters affecting both States.

October 1937, the Federal hay-grading school held in San Francisco for several days, then to Los Angeles for field training. This school was attended by the supervising inspector of this division and several deputy inspectors representing several of the hay producing counties of the State.

March 21, 1938, a meeting of Federal officials and representatives of the Western States to perfect final plans for the 1938 Mormon cricket control campaign.

June 14–19, 1938, a meeting of the Western Plant Quarantine Board held at Denver, Colorado, followed by a conference of the Western Weed Committee.

Although Nevada holds representation in the National Association of Commissioners, Secretaries, and Directors of Agriculture, it has not been possible to have a representative present at these sessions during the past two years owing to distance and expense involved.

ACKNOWLEDGMENTS

The Division of Plant Industry wishes to express its appreciation to the several Federal agencies which have generously cooperated in handling many of the serious problems affecting Nevada; among these may be named, in particular, the Bureau of Entomology and Plant Quarantine, Division of Grazing, Forest Service, Indian Service, Reemployment Service, WPA, and Bureau of Agricultural Economics.

Appreciation is also expressed to the State Highway Department and the Agricultural Experiment Station and Extension Service of the University of Nevada, and to the Boards of Commissioners and city officials of the cooperating counties and communities in the State.

All of these Federal, State and municipal agencies were concerned in the various phases of work carried on during the biennium and were most helpful in meeting many serious and difficult situations.

RODENT CONTROL

EDWARD RECORDS, *Executive Officer*

The 1937 Legislature appropriated $10,000 for the control of rodents to be expended through the State Department of Agriculture in cooperation with the U. S. Bureau of Biological Survey. As provided in the appropriation Act, a signed agreement was entered into effective July 1, 1937, providing for the expenditure of approximately $5,000 per year each from Federal and State funds on this work. The agreement having proved mutually satisfactory, it has recently been renewed for an additional year dating from July 1, 1938.

The work, since its inception, has been under the able direction of Mr. Geo. E. Holman, District Agent in Nevada for the U. S. Bureau of Biological Survey, to whose untiring efforts its success is largely due. The Forest Service, Bureau of Reclamation, Taylor Grazing Division, and the Nevada Agricultural Extension Service have also cooperated actively with Mr. Holman in the furnishing of services and supplies.

Owing to the number of interlocking cooperative agencies, it is impractical to segregate out completely the contribution of each. To give some idea of the work carried on and the results accomplished by the cooperating agencies as a whole, the following is quoted from Mr. Holman's annual report to his Bureau:

"A field crew of five men who started work in June 1937, continued efforts to reduce the rodent population around resorts and homes at Lake Tahoe, to reduce the danger of diseases being transmitted to residents, campers and pleasure seekers in that area, through the bite of ticks or fleas infected with disease through contact with diseased rodents. Control measures were applied on all resort, residence and camp areas on the Nevada side of the lake and for a considerable distance back from the lake to prevent immediate reinfestation. We cooperated with California agencies in treating border areas, and they treated the California areas. Property owners were instructed to clean up unfavorable conditions. The rodent population was greatly reduced and immediate hazards practically eliminated. Some work was carried on in the control of ground squirrels in Washoe County and then field work was discontinued until spring.

"During part of April, May, and June 1938, one party of men was in the field carrying on control activities in Carson Valley, Smith Valley, and Mason Valley and around Reno, where several thousand acres of farming lands were covered to control ground squirrels. Another party of men covered the ranch areas around Lamoille, Starr Valley and Lee, in Elko County. Control work was continued from two Divisions of Grazing, one Bureau of Reclamation and one Forest Service CCC Camp. It is estimated ninety or ninety-five percent of the rodents on these areas were destroyed.

"Several county agents cooperating by acting as the distributing agency through which poison was furnished to farmers for use on their own ranches. The poisoned grain was sold to the farmers at one-half its cost, the other half being borne by the Bureau and State. Poisoned grain was distributed to farmers through County Agents in Washoe, Lyon, Douglas, Churchill, Humboldt, Elko, Eureka, and White Pine Counties.

"In our control activities around Lake Tahoe three species of ground squirrels and three or four species of chipmunks were found, and control measures resulted in reducing the number of all rodents. This work was carried on during July and August 1937. Thallium-treated grain was used almost entirely, but some strychnine-treated grain was used in a few small areas. The thallium grain, already mixed, was secured through the California State Department of Agriculture. Ground squirrel work was done by Federal-State men in Elko, Washoe, Douglas, and Lyon Counties; by Division of Grazing, CCC Camps in Pershing, Elko and Clark Counties; by the Bureau of Reclamation CCC Camp in Churchill County; and by the Forest Service CCC Camp in Humboldt County.

"Demonstrations in pocket gopher control were given to ranchers in several localities, but little actual work was attempted by Bureau and State employees. Extensive campaigns were conducted from Division of Grazing and Bureau of Reclamation CCC Camps.

"Very little rabbit control work was done in any part of the State.

"Some marmot control was carried on in Washoe County, and several demonstrations were given farmers on methods to apply.

"The Forest Service cooperated splendidly by transferring to us for our use nearly 14,000 pounds of poisoned grain they had purchased in 1933–1934 and which was not used. It was necessary to re-treat this grain, and poison from our stock was used for this purpose. Part of this grain was distributed by our regular Federal-State crews and part by the Bureau of Reclamation CCC crew at Fallon, Churchill County, Nevada. Part of one lot is still on hand and being used in Elko County at the present time.

"Through the joint efforts of all concerned, rodents have been materially reduced on thousands of acres of agricultural and range lands, that has meant a saving in crops many times the cost of operation."

EMPLOYMENTS AND EXPENDITURES BY BUREAU OF BIOLOGICAL SURVEY AND STATE DEPARTMENT OF AGRICULTURE

Source of expenditures	Man-days employment Number	Expenditures Salaries Dollars	Expenditures Other Dollars	Expenditures Total Dollars
Federal Project 13	697	$4,047.75	$717.38	$4,765.13
Nevada State Dept. of Agriculture	498	2,758.65	882.48	3,641.13
Total	1,195	$6,806.40	$1,599.86	$8,406.26

AREAS TREATED BY BUREAU OF BIOLOGICAL SURVEY AND STATE DEPARTMENT OF AGRICULTURE CREWS

Species of rodent	Lands Treated Federal Acres	Lands Treated State Acres	Lands Treated Private Acres	Lands Treated Total Acres	Premises Treated Rats, Mice Number
Ground squirrels	....	....	79,643	79,643	
Pocket gophers	....	....	5	5	
Field mice	....	....	186	186	
Mice and rats	....	....	.....	.....	6
Total	....	....	79,834	79,834	6

QUANTITIES OF POISON BAIT USED BY BUREAU OF BIOLOGICAL SURVEY AND STATE DEPARTMENT OF AGRICULTURE CREWS

Species of rodent	Pounds Used on Lands Covered — Federal Pounds	State Pounds	Private Pounds	Total Pounds
Ground squirrels	....	....	18,879	18,879
Pocket gophers	....	....	4	4
Field mice	....	....	49	49
Mice and rats	....	....	18	18
Total	....	....	18,950	18,950

NOTE—Also three packages of Red Squill rat poison distributed.

SUMMARY OF RODENT CONTROL ACTIVITIES BY ALL COOPERATING AGENCIES

Total area covered	194,264 acres
Total poisoned bait distributed	66,070 pounds
Estimated savings in farm crops and forage	$96,632.00