



# ANNUAL REPORT OF THE DEPARTMENT OF AGRICULTURE

*For the Year ended 30th September, 1946*

## SECTION I. REVIEW

### POLICY

In a number of previous Annual Reports issued by this Department a paragraph has been included in which the broad outline of the policy governing the activities of the Department has briefly been stated. It is proposed to preface this Report with a full summary of this policy, itemised under appropriate headings.

#### **Anti Soil Erosion Measures**

2. (a) In the lowlands the soils are largely exhausted and the water absorptive capacity is very low, and "run off" high. On the steeper slopes, therefore, graded terrace banks are constructed, by mechanical means, but on the more gentle slopes, buffer grass strips in conjunction with terrace banks are used to check erosion.

3. (b) *Grass Stripping*. A large proportion of the arable land of the Territory is quite inaccessible to wheeled transport, and, therefore, to mechanical means of construction of erosion control works. As an alternative, strips 6 feet wide are surveyed on the contour at 6 feet vertical intervals through all cultivated lands, and allowed to revert to their natural vegetative covering. Strips are also surveyed through virgin grassland which is to come under the plough. The 6 feet vertical interval between strips, which is insisted upon, has the effect of restricting cultivation to those mountain slopes where the grade is not too steep for arable purposes.

4. Grass stripping in the mountains is being supplemented by manually constructed graded training banks, placed where possible at the top of cultivation on slopes to divert storm run-off from higher ground.

5. (c) *Controlled Grazing*. Systems of rotational grazing have been introduced in a number of centres, with the object of improving grazing, or, as is more often the case, allowing the re-establishment of proper grass cover on the mountain slopes.



6. (d) *Dam Construction.* To obviate the necessity for stock walking long distances to and from water, with resultant damage to herbage, the construction of earthen dams at frequent intervals in the lowland section of the Territory is a policy which is systematically being followed.

### **Fertility of Arable Land**

7. (a) The Basuto commonly use kraal manure as a fuel supply. By every possible method, including the provision by Government on loan of a number of two-wheeled carts, the people are being urged to return kraal manure and village refuse to the soil. Concurrently a tree planting campaign has been initiated, in order to provide an alternate fuel in an otherwise practically fuel-less country.

8. (b) As a temporary war-time expedient, superphosphate has been used in the Territory. It is felt that this is incorrect as a long term policy to be adopted at present, and the use of superphosphates is not being encouraged.

9. (c) Rotation of crops, and the greater use of legumes in the rotation, are being fostered.

10. (d) Experiments are in progress to demonstrate the value of grass leys for soil regeneration, including in "treatments" the use of local, free-seeding perennial species.

### **Crop and Stock Improvement**

11. (a) *Wool.* The major export from the Territory is wool. In 1935 a system was initiated providing for the introduction of pure-bred Merino rams, combined with the castration of all locally bred rams of undesirable type. Since that date there has been a regular importation annually by the Department of many hundreds of Merino rams, which are sold at under cost price to the Basuto.

12. (b) *Mohair.* As a safeguard to the Mohair industry the importation of goats of other than the Angora breed is prohibited.

13. (c) *Cattle.* In general, cattle importations are limited to the hardy Afrikaner type, but individuals who are prepared to provide supplementary feeding are permitted to import cows of exotic breed for their domestic milk supply.

14. A commencement has been made in the breeding up of a herd of native cattle, milk yield and ability to maintain condition on the natural veld being used as the first criteria for the selection

of foundation stock. The object of this work is to produce animals of known ancestry for sale to the Basuto, which can withstand the rigorous conditions under which the native cattle have to exist during the winter.

15. (d) *Poultry and Pigs.* Small breeding pens of purebred poultry and pigs are maintained at Maseru for the issue of improved breeding stock as required.

16. (e) *Wheat Improvement.* Breeding work, combined with variety trials, has been in progress for a number of years, the ultimate object being to improve yield and baking qualities of Basutoland wheat. Wheat as at present grown is of an exceedingly mixed type, and it is the aim of the Department ultimately to replace this with a strain or strains having qualities desirable from all points of view.

17. As far as possible all wheat issued for seed is treated for smut.

18. Legislation has been introduced to prevent the spread of wild oats. This weed is becoming of increasing importance as a limiting factor in wheat yields.

### Education

19. The education of the people of the Territory in adopting better methods of agriculture is the main concern of the Agricultural Demonstrators. Teaching is effected by using a system of demonstration plots worked by the owners under the supervision and advice of demonstrators, combined with simple topical lectures. As far as possible Basuto who have had training at one of the Agricultural Schools in the Union of South Africa are recruited for this purpose.

20. The work of the demonstrators is supplemented by practical instruction given in school gardens, and by publications. A quarterly bulletin is issued, containing instruction both in English and in the Sesuto language, in the agricultural operations which should be in progress each month.

21. Instruction is given by teachers at all schools, in Elementary Agricultural subjects.

22. Three demonstration holdings, of the approximate size of the customary arable holding of a Basuto family, viz. about six acres, have been established. All agricultural operations on these holdings are supervised by the Agricultural Officer in whose district the holding is situated.



23. There is no provision within the Territory for agricultural training to be given at an institution.

### **Nutrition**

24. The first step towards rationalising the diet of the Basuto has been taken by the establishment, under the supervision of demonstrators, of individually owned vegetable gardens and the provision of seedling fruit (mainly peach) trees. The encouragement of vegetable gardening is at present considered one of the more important aspects of a demonstrator's duties.

25. In the course of time the milk yield of local cows should be improved by the cattle improvement scheme, to which reference has already been made, which will allow of milk entering more into the normal Basuto diet than is the case at present.

### **Agricultural Improvement Areas**

26. Under the various headings given, the policy in regard to the main aspects of land usage and conservation has briefly been outlined. With the approval of the Paramount Chief and the Basuto concerned, certain areas are to be declared Agricultural Improvement Areas, in which a combined policy in regard to all matters is to be brought into effect in an intensive manner. It is unfortunate that the question of stock limitation, a matter of fundamental importance in a scheme of reclamation such as is required in Basutoland, will not at present be considered by the Basuto.

### **Standards for Export Produce**

27. The chief export from the Territory is wool. Prior to 1937 no attempt had been made to classify wool in any sort of manner, with the result that the Basutoland product generally commanded a relatively poor price on the overseas markets. In that year a system of very simple classification by the producer was introduced. In the intervening years the need for sorting has gradually become understood by the Basuto, and it is considered that it will shortly be possible to introduce a slightly more complex system of classification.

28. At present wool is not allowed to be exported unless accompanied by a certificate stating that simple classification has been satisfactorily carried out.

## Staff

29. During the year Mr. Henderson and Mr. Wachter retired from the posts of Principal Veterinary Officer and Principal Agricultural Officer respectively. These positions were filled by the appointment of Mr. Hay and Mr. Bowmaker. Mr. E. Heering retired and his place as accounting clerk was taken by Mr. R. Heering.

30. It proved impossible during the year to secure the services of a Veterinary officer, an Assistant Conservator of Forests, or an Agricultural and Education Officer, although provision was made in the Estimates for these posts.

31. *Administration.* The actual strength of the approved establishment of the Executive staff consists of :—

### APPROVED ESTABLISHMENT

1 Director of Livestock and Agricultural Services  
1 Principal Veterinary Officer  
1 Principal Agricultural Officer  
1 Veterinary Officer  
1 Assistant Conservator of Forests  
1 Agricultural and Education Officer  
1 Agricultural and Livestock Officer and Experimentalist  
1 Anti-Erosion Officer  
4 Senior Agricultural and Livestock Officers  
8 Agricultural and Livestock Officers  
7 Anti-Erosion Foremen  
1 Mechanic  
2 Veterinary Assistants  
113 Demonstrators and Assistant Demonstrators

### ACTUAL STRENGTH

1 Director of Livestock and Agricultural Services  
1 Principal Veterinary Officer  
1 Principal Agricultural Officer  
  
1 Anti-Erosion Officer  
3 Senior Agricultural and Livestock Officers  
8 Agricultural and Livestock Officers  
6 Anti-Erosion Foremen  
1 Mechanic  
2 Veterinary Assistants  
109 Demonstrators and Assistant Demonstrators

32. Now that the war is over, personnel is gradually becoming available again, and it is hoped that next year it may be possible to engage officers to complete the establishment.

## Weather Conditions

33. A second very dry, almost disastrous year has to be recorded. Planting rains, except in isolated areas in the foothills, did not materialise until the end of December. Six weeks of drought during February and March gave crops in the lowlands a setback from which they did not recover, and the mountain wheat crop was largely frosted before it reached full maturity. The winter, however, was comparatively mild, with the result that stock did not show the usual distressing lack of condition in August and September.



34. Average monthly rainfall figures for the nine stations where rainfall was recorded, are as follows :—

October	1.24 inches
November	1.74 inches
December	2.10 inches
January	5.42 inches
February	2.93 inches
March	4.19 inches
April	2.13 inches
May	2.45 inches
June	.11 inches
July	.14 inches
August	.01 inches
September	.35 inches
Total	<u>22.81</u> inches

35. The total rainfall of 22.81 inches is to be compared with the average rainfall for the Territory over the previous 30 years of 29.21 inches.

## SECTION II. AGRICULTURE

36. *Maize and Kaffir Corn.* As in the previous year, the crops in the northern lowlands and the foothill areas were fair to good. In the eastern and southern districts crops were largely a failure. On account of the lateness of planting rains and their very patchy nature in all districts, many lands were not sown. The first frosts, fortunately, were late, which allowed for the maturing of crops which in a normal season would have been far too late to come through.

37. Demonstration plot yields and yields from comparable "check" plots are given in a summarised form as follows :—

TABLE I

	<i>Maize</i>		<i>Kaffir Corn</i>	
	DEMONSTRATION PLOTS	CHECK PLOTS	DEMONSTRATION PLOTS	CHECK PLOTS
Number	210	191	13	27
Area	554 acres	578 acres	49 acres	62 acres
Yield	980 lbs per acre	306 lbs per acre	512 lbs per acre	220 lbs per acre

38. *Wheat.* The winter wheat crop, harvested in December, 1945, was again almost a failure on account of dry weather in the Spring. A larger area was planted in April and May 1946, particularly in the south-western districts where it was very evident that a shortage of food was likely to occur. This crop was adversely affected by the exceptionally dry winter.

39. Spring wheat in the mountains was sown very late, and large areas were affected by frosts before maturity had been reached. The crop was poor, and on account of premature ripening quality was indifferent.

40. Yields of mountain wheat from demonstration plots and comparable "check" plots are given in Table II.

TABLE II  
*Wheat Yields*

	DEMONSTRATION PLOTS	CHECK PLOTS
Number	70	48
Area	214 acres	170 acres
Yield	540 lbs. per acre	182 lbs. per acre.

41. *Beans.* The late planting season resulted in a much reduced acreage of beans. The dry spell in February and March coincided with the flowering period, and only very poor crops were harvested.

42. *Peas.* The winter sown crop was again a complete failure. Mountain peas, sown in November and December in those areas where rainfall conditions were suitable, gave but indifferent yields of inferior produce.

43. *Barley.* As with the other crops of minor importance only a small acreage of barley was planted. Yields and quality were poor.

44.

TABLE III

**Approximate Agricultural Production for 1946 and Preceding Years,  
in Bags of 203 lbs.**

Crop	1940	1941	1942	1943	1944	1945	1946
Maize	691,542	1,005,268	527,634	720,000	700,000	400,000	414,000
Sorghum	139,965	274,156	164,493	324,000	300,000	150,000	123,000
Wheat	398,861	394,688	182,187	360,000	416,000	325,000	156,500
Other Crops	133,353	73,593	36,796	40,000	56,000	40,000	32,000
Total	1,363,721	1,747,705	911,110	1,444,000	1,472,000	915,000	725,500

45. *Increased Food Production and Propaganda.* The methods by which this was to be achieved have been outlined in a previous Report, and it is unfortunate that efforts in this direction were largely offset by the very difficult season.



46. Reference to Tables I and II will show, however, that supervised better farming methods can result in very large increases in crop yields, even under the most adverse set of weather conditions.

47. During the year the issue of a quarterly agricultural bulletin was initiated. This takes the form of a pamphlet printed in both English and Sesuto, of which 30,000 copies are distributed through the Territory. In the pamphlet are listed the agricultural operations which should be in progress, special stress being laid on those matters which lead to better farming methods. The bulletin has been well received by the more progressive farmers.

48. *Manuring Campaign.* 10,300 loads of kraal manure and ash were carted on to lands by the use of government owned scotch carts. This figure is slightly lower than that for the previous year, but the difference may be accounted for by the fact that a number of breakdowns occurred during the manuring season, which occasioned delays. The figure takes no account of the large quantity of manure carried in baskets and by sledge. It may safely be said that the use of manure and ash is becoming a routine part of crop production in parts of the north-western lowlands.

49. The object behind the loan to the people of government owned carts is that ultimately individuals or small syndicates will become owners of vehicles. The present cost of scotch carts is against such a development. The need exists for a rugged, cheap cart, and during the next season two comparatively inexpensive, all steel carts, are to be brought into the Territory for trial and demonstration purposes. If they are a success, it is likely that many Basuto will become possessors of similar vehicles.

50. There is no doubt at all that largely increased returns are within the reach of every farmer. This is borne out by the figures shown in Tables I and II. Practically all the demonstration plots were manured, and the two to three-fold increases shown in yields are due very largely to applications of manure or ash.

51. The residual effect of applications is to form the subject of observation in coming seasons.

52. *Phosphatic Fertilizers.* As in previous years, a large demand for fertilizer was found to exist in the north-western lowland districts. 525 bags of superphosphate and 224 bags of Kalfos were sold to farmers at cost price. This quantity would have been exceeded had further supplies been available.

53. *Seed Issues.* Over 3,000 bags of wheat and 500 bags of maize were purchased for resale for seed purposes in the year under review. Seed is usually purchased in districts where fair crops are harvested, and transported to those districts where crop failures or partial failures are likely to result in a shortage of seed.

54. In addition to the above, small quantities of barley, kaffir corn and beans were also purchased and re-sold.

55. *Vegetable Gardens and Fruit Trees.* There are now 10,442 vegetable gardens being worked under the supervision and on the advice of demonstrators. This is an increase of 1,027 over the figure for the previous year. Again it has to be pointed out that this does not reflect the true number of gardens, as many Basuto now work their gardens without any assistance.

56. There is no doubt that in addition to bringing the national diet on to a more sound footing, vegetable gardens during the season under review have assisted to a degree in eking out the poor supplies of grain harvested.

57. A number of vegetable garden competitions were held, and £36. 15. 0. was paid out in prize money. The general quality of produce was not up to the usual standard, however, on account of the poor weather conditions during February and March.

58. 100 Quince trees, 535 Peach trees and 1,522 rooted grape vine cuttings were distributed during the year.

59. *Agricultural Shows.* Several shows were held, the sum of £62. 5. 6. being paid out in prize money.

60. A fall in the general standard of exhibits was to be expected from the nature of the season. Competition remained very keen, however, and the number of exhibits and attendances were considered very satisfactory, particularly in view of the fact that the shows are organised entirely by local Agricultural Associations.

61. *Produce Markets.* These markets continue to be very well patronised, and are thought to act, in numerous instances, as an incentive to the use of better and more intensive production methods.

62. *Agricultural Associations.* The number of active associations functioning in the Territory is 169, of which 65 are Men's Associations and 99 Women's, representing increases of 25 and 10 respectively. The number of Mixed Associations has fallen considerable.



rably. The Associations serve a very useful purpose ; apart from fostering the community spirit, they are also furthering the work of the Department of Agriculture.

63. *The Work of Demonstrators.* Demonstrators' work gave outstanding results in this difficult season. Furthering the campaign for increased food production formed the main object of their efforts, this being accomplished by means of manuring, the increased use of implements and row-planting, cleaner and more frequent cultivation and hoeing. Tables I and II show that yields of wheat and maize, from lands where farming methods were controlled by demonstrators, were roughly trebled, using comparable lands worked without assistance by Basuto as a basis of comparison.

64. Only two field competitions were held, the sum of £9 being paid out in prize money.

65. Other work in the schedule laid down for demonstrators included the laying out of grass buffer strips in the mountains, village tree planting, lectures on seasonal topics, and the dosing of small stock. These matters are dealt with under their respective headings.

66. *Lectures and Demonstrations.* 78 lectures were given by Agricultural and Livestock Officers and 932 lectures and demonstrations by Demonstrators, to a total attendance of 34,660 Basuto. Topical subjects are chosen for lectures and demonstration purposes, emphasis being laid wherever possible on soil improvement and anti-soil erosion measures. Vegetable gardening, tree planting and manuring form popular demonstration subjects.

67. *Rodent Destruction.* Work in this direction, run in co-operation with the Medical Department, continues. The rodent position is considered to be well in hand.

68. *Insect Pests and Fungus Diseases.* Locusts. No swarms of locusts were reported in the year under review.

69. Elegant Grasshopper and Army Worm. Damage from these sources to young growth was negligible.

70. Maize Stalk Borer. It was patchy in its damage, and only in few cases was the latter severe. Topping was again successfully carried out.

71. Cutworm. This continues to form the main source of reduction in yield from insect pest causes. It is prevalent throughout

the Territory, and makes its presence most felt in vegetable gardens. Damage to both spring sown wheat and maize, however, is also considerable.

72. Winter ploughing is being advocated generally and has met with a fair and increasing response, and it is felt that the exposure of over-wintering pupae by this operation to the heavy frosts which occur during the winter will bring about a decrease in the incidence of this pest.

73. Aphis. Aphis attack, which often is severe in kaffir corn, was very light in the season under review. In the late autumn, however, severe attacks were recorded in vegetable gardens in most parts of the Territory.

74. Smut. All wheat seed issued by the Department (amounting this season to over 3,000 bags, as already recorded in paragraph 53) is treated with copper carbonate. In addition, wheat which is visibly infected with smut spores has been made unsaleable by legislation. Smut attacks in consequence have been very light indeed of recent years.

75. Rust. No serious outbreak of rust was recorded during the year, a state of affairs to be associated with the very dry season.

76. *Village and Reserve Tree Planting.* An effort was made during the year to conduct a census of trees surviving from those planted since the inception of the tree planting campaign in 1942. Owing to changes in staff, and the limited staff available, and more particularly the spreading habit of the species most commonly planted (*Populus canescens*) it was found quite impossible to make an accurate account of the survivors of the eighteen million odd trees which had been planted. Mortality, mainly from drought, had been very heavy, particularly during the last year. Further losses, but of a comparatively minor nature, have occurred from stock trespassing and accidental fire. There are, however, sufficient trees surviving to form good evidence in all parts of the lowlands of the effort which has been put into the campaign.

77. An Assistant Conservator of Forests is to be stationed in Basutoland, whose first duty it will be to indicate lines of attacking the tree problem in the mountain areas.

78. In spite of most adverse weather conditions, a further 2,400,000 trees were planted in the Territory during the year.

79. *Control of Foodstuffs.* It became evident, with the ripening



of crops, that a serious food shortage would have to be faced before the following summer. Accordingly, an embargo was placed on the export of all grain. To remove the likelihood of a black market being built up within the Territory, selling prices of grain were again gazetted. Wheat is normally grown almost wholly for export. To keep wheat in the mountains, where it was likely to be needed to replace maize as food, a uniform price was fixed throughout the Territory in place of the zone price system which has been in use heretofore.

80. The distribution of food in the Territory is entirely the function of traders. The fixation of selling prices, and the equitable distribution of imported foodstuffs, have called for the full co-operation of the trading community with the Government. To this end an Advisory Board, elected from the members of the Basutoland Chamber of Commerce, was formed, whose function it is to offer advice to the Director of Agriculture on matters concerning food distribution. The help given by this Board has proved of very great value indeed.

81. *Experimental work.* Experiments in progress in the Territory may be divided under two headings—crop improvement and grassland management. Work is being carried out at Maseru (elevation about 5,000 feet), Makhaleng in the foothills (elevation about 6,800 feet) and at Thaba Tšoeu and Thaba Putsoa, both of which are over 8,000 feet above sea level. In addition there are several centres where controlled grazing and burning is being carried out by chiefs in the mountains under the supervision of Agricultural and Livestock Officers, where observations on different treatments for the control of valueless scrub are in progress.

82. *Crops.* The problems which are under investigation at present are : improvement of varieties, manuring and crop rotation, and the introduction of new cash crops.

83. (a) *Maize.* A manurial trial comparing the effect of normal applications of superphosphates and rock phosphate, without and with various rates of application of kraal manure and kraal ash, gave an increased yield only in the case of a heavy application—10 tons per acre—of kraal manure.

84. The rotation trial gave no significant differences in yield in the subsequent crop of maize.

85. Both the trials are being continued.

86. (b) *Wheat*. The wheat selections planted at Maseru did not do well on account of the dry season, and have been re-sown for further observations.

87. A variety trial conducted at Maseru gave no results, also because of drought. At Makhaleng, however, which station represents a comparatively large area of Basutoland, satisfactory yields were obtained.

88.

TABLE IV

*Wheat Variety Trial, Makhaleng*

Variety	Days to Mature	Yields (lbs per acre)	B.W.	Grade
Ceres	132	2,937	64	A1
Talberg	154	2,659	58	B3
Hope	132	2,086	60	A2
Marquis	132	1,996	61	A2
Thatcher	132	1,761	61	A2

Difference required for significance ( $P=0.05$ ), 374 lbs per acre.

89. For the second season Ceres thus outyields all other varieties except Talberg, which in turn outyields the remaining varieties.

90. Steps have been taken to secure a larger bulk of Ceres for distribution, as this variety seems satisfactory from all points of view.

91. (c) *Kaffir Corn*. A trial of various types of kaffir corn commonly grown in the Territory, together with two of the best Swaziland strains, was carried out at Maseru.

92.

TABLE V

*Kaffir Corn Variety Trial, Maseru*

Variety	Days to exertion	Yield (lbs per acre)
Roma Red	107	855
Roma White	94	641
Berea Red	107	555
Makanya	107	525
Berea White	94	465
Teyateyaneng White	94	394
Qacha's Nek Red	107	300
74 T. Swaziland	78	244
127 Swaziland	78	214
Quthing White	107	202



Difference required for significance ( $P=.05$ ), 240 lbs. per acre.

93. Under the climatic conditions of the season, all the above yields must be considered fair. There is a very large difference between the best and worst of the varieties included in the test. Inasfar as all these varieties, with the exception of the two Swaziland strains, are grown in considerable quantity within the Territory, it is felt that a large general improvement in yield of kaffir corn may be possible by the substitution of the better yielding strains, where necessary, for those in general use. Issues of improved varieties are made to selected farmers, for bulking.

94. The two Swaziland strains, included on account of their earliness, were also sown for observations at Makhaleng, but failed to mature.

95. (d) *Potatoes*. Various unimproved strains of potatoes are commonly to be found throughout the foothill and mountain areas. A collection of strains was made and a variety trial conducted at Makhaleng, the yields being as in Table VI.

96.

TABLE VI

*Potato Variety Test. Makhaleng*

<i>Variety</i>	<i>Yield (lbs. per acre)</i>
Butha Buthe 1	28,120
Butha Buthe 3	21,242
Butha Buthe 2	13,812
Qacha's Nek 1	9,538
Difference required for significance ( $P=.05$ ), 4,636 lbs.	

97. (e) *Pyrethrum*. A very poor yield of flowers was picked, and numbers of plants died during the summer drought.

98. *Grassland Management*. The correct management of grassland forms one of the most important subjects for investigation in the Territory. The question falls naturally into two distinct subdivisions, the dividing line being one of altitude, (between 6,000 and 7,000 feet).

99. (a) *The Lowland Problem*. For many years the lowlands have been overstocked; as a result there are everywhere signs of erosion, and there is generally insufficient feed for cattle in the

winter. Reduction in stock numbers must eventually take place, and an effort is being made at Maseru to determine the effect of stocking at the rate of one large beast to 5 acres of land, as a preliminary to the institution of stocking regulations.

100. A second problem is that of the proper use of worn out arable lands and the quickest method of bringing about their regeneration. A grass ley experiment was laid out at Maseru in June, 1945, from which the following observations were obtained :—

101. By January 1946 *Paspalum dilatatum*, *Festuca elatior*, *Chloris gayana*, and *Phalaris tuberosa* had died out. Lucerne could not stand competition with other grasses, and had also died out. Local *Eragrostis* spp. behaved very well in comparison with exotic species.

102. In addition to this experiment, observation plots of various local and exotic species were also laid down at Maseru for notes on frost and drought resistance.

103. The following species remain green throughout the winter :—

*Festuca elatior*, *Bromus marginatus*, and *Phalaris tuberosa*.

104. The following were completely killed by frost, or later by drought :—

*Setaria tenuisetata*, *S. sphacelata*, *Paspalum notatum*, *Chloris gayana*, *Trifolium johnstonii*, *Festuca elatior* and *Acroceras macrum*.

105. The species thus remaining from those which have been under trial and which are drought resistant, and of which only the top growth is affected by frost are :—

*Eragrostis chloromelas*, *E. curvula*, *E. obtusa*, *Digitaria eriantha*, *D. Smutsii*, *Panicum coloratum*, *Bromus marginatus*, and *Antherophora pubescens*.

106. The most promising grasses for local use are considered to be *Eragrostis chloromelas* and *E. curvula*, and more intensive work is being carried out using these species. They have the additional advantage of being local grasses from which seed is easily obtained ; if results come from their use in experiments the latter will permit of immediate and universal application within the Territory.

107. (b) *The Mountain Problem*. The mountain areas are grazed mainly during the summer. The northern, north-western and north-eastern slopes were originally covered with sweet (*Themeda*) grass,



while the colder slopes grew "sour" grasses of which *Festuca caprina* is the dominant species. Stock naturally congregate on the sweet grass, with the result that this has been slowly eaten or trodden out, and its place has been taken by useless scrub *Chrysocoma tenuifolia* predominating. The grazing value of the mountain slopes has steadily deteriorated; in addition, *Chrysocoma* offers little resistance to soil erosion. A very large percentage of the mountain slopes has been damaged in this way, and it is considered to be the matter of most urgent and vital importance that these slopes should regain their former grass covering.

108. Experiments at Thaba Tšoeu and Thaba Putsoa, and elsewhere where controlled grazing is in progress, indicate that a return to Themeda may be achieved by simple restriction of stocking and rotational grazing. At Thaba Putsoa, an area which eleven years ago was covered with *Chrysocoma*, and at that time was fenced, the return to Themeda is practically complete. This area is now being used for the determination of carrying capacity of mountain slopes which have returned to their climax vegetation. Alterations in vegetation are being checked by a system of transects, where the botanical composition of the veld is determined from time to time. The results of these observations will, however, have no immediate application.

109. The Paramount Chief has set aside an area of 1,150 acres at Thaba Tšoeu on which the good effects of controlled rotational grazing may be demonstrated. When the demonstration was commenced two and a half years ago, the area was densely covered with *Chrysocoma* and the grazing so poor that it was most difficult to maintain adequately the correct number of animals on the available grass. The results of the control are most satisfactory for after only three seasons, the *Chrysocoma* is dying out and grass rapidly taking its place. As the area is not fenced the demonstration is capable of large scale and immediate application.

## SECTION III. LIVESTOCK AND VETERINARY

### Economic Aspect

110. Although the period was one of partial drought, livestock were favoured with a relatively mild winter, and managed to maintain fair condition: however, some mortality did occur, although not to a noteworthy extent.

111. At Auction Sales of livestock, held at the usual centres on five occasions during the period October, 1945, to September 1946, average cattle values reached their highest recorded peak viz. £12. 12. 0. but this coincided with a sharp decrease in the numbers of cattle presented for sale (see paragraph 142). Owners were generally unwilling to sell anything but the oldest class of oxen. It was noteworthy on one occasion that when young oxen introduced from the Union were available for purchase (by private treaty) in pens adjoining the sale ring, there was less haggling in the auction ring: native owners being thus reassured that younger oxen, available for ploughing were obtainable in replacement of the older animals offered for sale. The intensive propaganda for increased grain production was reflected in the active demand for younger categories of work oxen, and officers purchasing such for Government use had to pay prices considerably higher than hitherto.

### Statistical Review

112. The usual biennial census of livestock falls due in February, 1947, and comparative data are therefore not available for discussion in the present Report. It is obvious, however, that the Territory generally is carrying more livestock than wise husbandry should permit. This situation has been aggravated by

113. (a) the tendency for Basuto working in the Union to accept cattle, to a greater or lesser degree, in lieu of wages, or to invest savings in such, and to introduce such animals into Basutoland, and

114. (b) the ploughing up of fresh ground for crop production in past years with a corresponding reduction of available grazing ground.

115. The figures for exports and imports for the period under review indicate the usual preponderance of imports over exports, viz. 8,847 cattle, 3,448 horses and 26,669 sheep introduced into Basutoland against export figures of 3,088, 257 and 1,168 respectively.



Comparative figures for the previous year will be found in paragraph 146, but it may be noted here that, due to import and export restrictions arising from the prevalence of lumpy skin disease in the Orange Free State, and its later discovery within Basutoland, cattle movements in either direction were suspended, or came under partial embargo, for varying periods, with the result that the figures for both import and export are less than in the previous year. Restrictions were not applied upon the movements of other categories of livestock as this disease appears to be one of cattle only.

116. Issues of vaccines remained near the level of the previous year, the decrease in the case of anthrax vaccine arising from the smaller number of cattle passing through the various ports of entry (and exit): all of which are inoculated as a precautionary measure

### **Animal Health**

117. Most of the questions under this heading relate to nutritional conditions, specific or preventable diseases probably accounting for no more than a fraction of the mortality occasioned by mal-nutrition or its sequelae. The partial drought existing over the period under review was responsible for considerable, although not excessive, mortality in all categories of livestock. Cattle, horses and donkeys cannot be put to work at such periods, and succumb rapidly in cold weather. Indeed the mortality amongst donkeys in Basutoland is proverbially severe at all times, due to their universal use as pack animals.

### **Disease Control**

118. *Anthrax*. Five outbreaks of this disease occurred in the Butha Buthe, Leribe, Maseru and Mafeteng districts. Mortality was, so far as is known, limited to individual animals in each case. Control was effected by vaccinations of contacts.

119. *Equine Mange*. This disease appears to be fairly widespread, but it is virtually impossible to eradicate with present facilities. Treatment is made available by the issue of limesulphur dip material, wherever required, and affected animals are washed in appropriate dilutions. It is unfortunate that cattle dipping tanks are not available, as these would permit an easy and rapid method of eradication.

120. *Anaplasmosis*. No significant mortality from this disease is believed to have occurred; although European owners of improved or introduced stock frequently inoculate as a preventive.

121. *Horse-sickness*. Sporadic cases were reported, but mortality was negligible.

122. *Blue Tongue*. No cases reported.

123. *Fowl Typhoid*. Vaccination against this disease is increasing, and this disease is no doubt prevalent. A field exists for research into fowl diseases, however, it being difficult to determine at present the collateral prevalence of such diseases as bacillary white diarrhoea, coccidiosis, or worm infestation, all of which are known to be frequent causes of fowl mortality.

124. *Lumpy Skin Disease*. This disease made its first recorded appearance in Basutoland near Maseru, in June 1946, and has since been identified at two other points. No mortality has been reported. Its effect upon the native type of cattle is, by common experience, much less severe than in exotic and improved categories, particularly dairy animals. This may account for the paucity of recorded outbreaks, as it must be assumed that the disease has appeared elsewhere; but owners have probably failed to note anything deserving of report to the nearest veterinary official. In any event, neither an effective method of control, nor a remedy for this disease has yet been evolved so that particular action, even in the event of an outbreak, is not called for at the present stage.

### Animal Husbandry

125. *Small Stock*. The poundage of wool classed under official supervision, i.e. Government classed wool, showed an increase of 73,092 lbs. over the previous year. Practically the whole of the balance of the wool exported was simply classed by flock owners, with the assistance of Government Wool Inspectors, where necessary.

126. Besides the poundage of wool classed under official supervision, many traders are shearing on their stations and classing on the lines laid down by the Government.

127. The following table gives a summary of the wool classing position from 1943 to 1946.

TABLE VII

	1943-1944	1944-1945	1945-1946
Number of sheep shorn under official supervision	178,177	190,761	175,225
Poundage of wool	958,427	958,108	1,041,200
Average poundage per sheep	5.4	5.0	6.88
Percentage of combings	34.03	28.53	27.65
Percentage of short wool	20.12	23.06	29.70
Percentage of XM wool	10.76	7.73	6.95
Percentage of outsorts	35.09	40.68	35.75



128. The total quantity of wool and mohair exported during the report year was :—

Wool 10,077,586 lbs.

Mohair 1,647,791 lbs.

129. Compared with the previous year this represents an increase of 296,586 lbs. in the case of wool, and an increase of 360,790 lbs. in the case of mohair.

130. Prices generally were on a lower basis than the previous year. Average prices were as follows :—

TABLE VIII

GOVERNMENT CLASSED		SIMPLY CLASSED PRICES PAID BY TRADERS
C. 1	9 $\frac{1}{8}$ —10 $\frac{1}{2}$ d. per lb.	Longs 7d.—8d. per lb.
C. 2	8 $\frac{1}{2}$ —8 $\frac{7}{8}$ d. per lb.	Shorts 5d.—6d. per lb.
S.S.	7 $\frac{3}{4}$ —8 $\frac{3}{8}$ d. per lb.	B.P. 3d. per lb.
S.	7—7 $\frac{3}{8}$ d. per lb.	Lox 2d—2 $\frac{1}{2}$ d. per lb.
X.M.	7 $\frac{1}{4}$ —8 $\frac{1}{8}$ d. per lb.	
C.B.P.	7 $\frac{1}{4}$ —7 $\frac{7}{8}$ d. per lb.	
B.P.	6 $\frac{3}{8}$ —7 $\frac{5}{8}$ d. per lb.	
B.K.S.	7 $\frac{1}{2}$ —7 $\frac{5}{8}$ d. per lb.	
Lox	4 $\frac{7}{8}$ —5 $\frac{1}{4}$ d. per lb.	

131. During the Current Financial Year, 532 Merino Rams were introduced from the Union for resale to African sheep farmers, making a total of 6,954 improved Merino Rams introduced by the Government since the inception of the Sheep Improvement Scheme in 1935.

132. *Cattle.* The usual improvement operations have been maintained, viz. castration of undesirable animals; the leasing or transfer of approved bulls to owners requesting such; auction sales at reasonable intervals for the disposal of aged, redundant, or unsuitable bulls (343 were so disposed of during the year). Also at the few Agricultural Shows it was possible to organize during the period in question, prizes were given for the better animals in all the main categories, and it was found possible to address the natives present and indicate the reasons for the judges' selection.

133. A proportion of the bulls issued to natives in recent years have died or have been placed out of service by reason of age, injuries or other causes. The census to be taken in 1947 will reveal

the extent to which replacement has become necessary or expedient in many cases.

134. *Equines.* An adequate number of horse stallions are maintained at the three stud stables situated at Maseru, Mafeteng and Quthing, in addition to those purchased outright by natives or loaned to them and available for service in outlying districts. The forthcoming census will reveal how many of the latter categories are still in service, it being impracticable at present to quote accurate data. The scheme has been a partial success only, owing to the communal character of the grazing facilities and the resultant difficulty of controlling services. Moreover, it is becoming clear that the use of Thoroughbred stallions almost exclusively, for improvement purposes, in a country with a diminishing nutritional level from the available natural grazing, requires reconsideration; as such animals tend to become too fine or stunted for the rough wear and tear of mountain travel and pack work.

135. It is gratifying, however, to record that the demand for donkey jacks for mule breeding is increasing, as the mule is better equipped to stand up to the rigours of the Basutoland climate, and is the pack animal par excellence under the conditions usually prevailing.

136. *Pigs.* The demand for weaner pigs has increased. During the year 60 weaner pigs were sold. At present only four breeding sows are kept. Two boars, one large black and one Tamworth are used, the idea being to be able to supply suitable weaners for breeding purposes.

137. When the supply of pig feed is easier more sows may be kept to meet the demand.

138. *Poultry.* The demand for young fowls is still on the increase. Two hundred three to four month old chicks were sold during the year. The birds kept are Australorp, Rhode Island and Light Sussex, of which the Rhode Island Red appears at present to be the most suitable.

### **Marketing of Animals and Animal Products**

139. At the nineteen sales held during 1945/46 in the western districts (Mohale's Hoek, Mafeteng, Maseru and Leribe) numbers of cattle sold were the lowest since 1939/40, but the price per head was the highest on record. These results are to be accounted for by



140. (a) interruption to cattle movements by the restrictions resultant upon the appearance of lumpy skin disease in adjoining districts of the Orange Free State, and later in Basutoland ;
141. (b) lessened sales' pressure by reason of the relatively prosperous condition of natives generally ; allotments and gratuities in respect of military service being a considerable factor.

142.

TABLE IX

REPORT YEAR	NO. OF SALES	NO. OF CATTLE SOLD	TOTAL SUM REALISED	AVERAGE PRICES
1938/39	10	257	£ 1,560 14 7	£ 6 1 5½
1939/40	11	784	£ 5,042 17 6	£ 6 6 7¾
1940/41	18	2,303	£14,740 19 6	£ 6 8 0¼
1941/42	18	2,539	£20,701 6 6	£ 8 3 0¼
1942/43	25	5,370	£52,844 19 6	£ 9 16 9
1943/44	22	3,423	£34,150 16 6	£ 9 19 6
1944/45	19	3,321	£35,516 4 0	£10 13 10¾
1945/46	19	1,862	£23,461 17 6	£12 12 0
TOTAL	142	19,859	£188,019 15 7	

143. Eight horses and one mule were also disposed of at nominal prices, being for the most part condemned Government animals.

144. No sheep were sold.

### New Legislation

145. High Commissioner's Notice No. 4 of 1946 publishing regulations for the control of "Lumpy Skin Disease".

TABLE X  
STATISTICS FOR 1945/46

Census	SHEEP	GOATS	CATTLE	HORSES	MULES	DONKEYS	FOWLS	PIGS
			NO CENSUS					
Doses administered for worms	6,882,968	2,721,480	36	1,112	2	1	—	—
Castrations		15,173	1,663	611	1	34	—	8
Dipping and treatment of external parasites	2,178	—	—	1,109	—	—	—	—
Exports	1,168	—	3,087	257	—	—	—	12
Imports	26,669	—	8,847	3,448	—	—	—	—
Wool exported (lbs)	10,077,586	—	—	—	—	—	—	—
Mohair exported (lbs)	—	1,647,791	—	—	—	—	—	—
Bones exported (lbs)	—	549,337 lbs.		—	—	—	—	—
Hides and Skins exported (Units)		18,422	9,074	—	—	—	—	—
Inoculations : Anthrax	—	—	28,885	—	—	—	—	—
Quarter evil	—	—	9,179	—	—	—	—	—
Anaplasmosis	—	—	429	—	—	—	—	—
Paratyphoid	—	—	10	—	—	—	—	—
Fowl Typhoid	—	—	—	—	—	—	1,317	—
Horse-sickness	—	—	—	587	—	—	—	—
Dosed for fluke	33,300	—	—	—	—	—	—	—
Services by Government Sires	—	—	1,282	672	—	122	—	—



## SECTION IV

### ANTI-EROSION WORK

#### Staff

147. The anti-erosion work is under the direction of the Anti-Erosion Officer, who, in addition to his general administrative duties, supervises the constructional work in the Maseru District. In the Districts this work is under the direct charge of either European or African Foremen and supervised by the District Agricultural and Livestock Officers.

#### Plant

148. Two new Caterpillar D4 tractors were purchased during the year at an approximate cost of £900 each. One of the old R.D. 4 tractors became unserviceable.

149. Eight tractor machinery units have been in operation in the lowlands throughout the greater part of the year, for the construction of graded terrace banks, using Sawyer Massey and Caterpillar graders. Spare parts for the Sawyer Massey graders became unobtainable, so that these machines have been out of commission for varying periods during the year, necessitating the use of ditchers and lighter equipment.

#### Work Done

150. In the mountains, which are inaccessible to heavy machinery, the work of stabilising the soil has been continued by the laying out of buffer grass strips and the construction of training banks immediately above the arable land, to hold the rush of water and to carry the surplus away on grade. As mentioned in last year's report, the construction of these training banks had, of necessity, to be carried out by using paid gang labour, which proved very costly. In view of the high cost, arrangements were made for the construction of these banks on contract; the contractor agreeing to construct the banks according to specification, at a flat rate of 15/- per 100 yards. This plan has reduced the cost by approximately four-fifths, and extremely satisfactory progress has been made in the mountain district of Mokhotlong where already 2,574 acres have been protected in this way.

151. The progress made in the principal sections of the work is shown in the following schedule :—

TABLE XI

Measure	Prior to 1946	During 1946	Total to end of 1946
Area terraced lowlands, acres	154,623.1	18,487.8	173,110.9
Length of Terrace constructed lowlands, yards	15,973,863	2,044,647	18,018,510
Buffer grass strips mountains, acres	80,465.7	49,597.9	130,063.6
Training Banks mountains	1,629	4,281	5,910
Dams constructed	179	16	195
Number of trees planted	822,207	3,661	825,868

152. These above grand totals of acreages protected by terraces, buffer grass strips and training banks, are made up from District totals as shown below :—

TABLE XII

District	Area terraced in acres	Area protected by training banks in mountains. Acres	Area protected by buffer strips Acres
Butha Buthe	2,492		2,491.3
Leribe	2,899		887.3
Teyateyaneng	1,723		2,948.5
Maseru	255		3,325.7
Mofoka	3,535		
Matsieng	2,868		
Mafeteng	2,401		3,695.2
Mohale's Hoek	2,314		1,296.7
Quthing			5,524.2
Qacha's Nek		1,707.8	12,711.8
Mokhotlong		2,574	16,717.2
TOTAL	18,487.8	4,281.8	49,597.9

### Terraces

153. The area in the lowlands protected by terrace banks during the year was less than that of the previous year. This was due to numerous breakdowns in the machinery units and the very dry weather experienced, making the soil too hard for easy working.

154. 1,492,259.6 cubic yards of earth were moved in constructing the 2,044,647 yards of terrace during the year.

155. The mean cost of constructing terraces was 8.8/- per 100 yards, which is 9d. above last year's costs.



### **Buffer Grass Strips**

156. In some areas the establishment of grass on these strips is very slow and results are therefore disappointing. Where, however, perennial grasses have become established the results are most gratifying, and it is quite common to find banks, some three feet high, covered with a thick mat of grass. This is especially noticeable in the districts where hillside or reversible ploughs are used.

157. The cost of setting out the grass strips was 1·4/- per acre, which is ·4/- less than last year. This was due to the more efficiently trained African Staff available, and the fact that there had been less re-marking than in previous years.

### **Dams**

158. The dams constructed are nearly all situated in dongas or gullies and are of sufficient capacity to hold water throughout the year. The total capacity of the sixteen new dams is 33,071,700 gallons, making the capacity for all dams constructed to date, 335,434,892 gallons. The cost per 1,000 gallons of water impounded in the new dams is ·4/- or 5d.

159. In addition, three dams have been constructed by the people free of charge and under departmental supervision. The total capacity of these dams is 881,380 gallons.

### **Tree Planting**

160. The season was most unfavourable for tree planting and well established trees in enclosed areas died during the winter. The few trees planted were willows and poplars in dongas, and even in these situations the rate of survival was very low.

### **Fencing**

161. Due to the difficulty of obtaining fencing materials, only 21·6 acres have been enclosed around dams and water spillways.

### **Grass Planting**

162. Several species of running grass have been tried out on dam walls and in gullies, and *Pennisetum clandestinum* (kikuyu) is the only grass which has done at all well. When once established this grass provides excellent grazing, and is proving most useful in healing up gullies.

## **Grass Spillways and Meadow Strips**

163. Twenty grassed-in spillways and meadow strips, the former for discharging surplus water into gullies, have been constructed during the year. These spillways and meadow strips are playing a very important part in the general anti-erosion scheme, and more attention is being paid to their layout.

## **Maintenance**

164. The importance of maintenance work cannot be overstressed, for if repairs are not effected to terrace banks after heavy storms great damage may result. One of the many duties of the Maintenance Men is to see that correct ploughing between terrace banks is carried out, that is—ploughing away from the channel on the upper side and against the banks of the terrace on the lower side.

165. Since April 1946 all expenditure in this connection has been met from the National Treasury Funds.

## **Transport**

166. Two new three-quarter ton Ford Light Delivery trucks were purchased during the year to replace two old vehicles which were boarded.

## **Costs**

167. The average cost of all anti-erosion work carried out in the lowlands was 11·7/- per acre. This figure includes dams, spillways, tree planting and mountain training banks; it excludes, however, the construction of mountain training banks on contract, the purchase and depreciation of plant and equipment, and the salary and allowances of the Anti-Erosion Officer and the Agricultural and Livestock Officers, and overhead Administration charges.

168. The cost of constructing training banks on contract, amounted to £321. 16. 0. or 4·8/- per acre.

169. Although, as a result of machinery breakdowns, it was not possible to maintain the same high acreage protected by terraces as last year, the progress in the protection of arable lands in the mountain areas has been most satisfactory and very much greater than ever before.



## SECTION V

### CONCLUSION

#### Financial Statement

170. REVENUE	EXPENDITURE
£2,528 8. 9.	£78,022 3. 4.

*Note.* Covering Financial Year ending 31st March, 1946.

#### *Visits*

171. A large number of visitors from the Union and East Africa, mainly interested in anti-erosion work, have visited the Territory during the year.

#### *Acknowledgement*

172. I desire once again to record the appreciation of my staff of the assistance and co-operation of officials and non-officials alike, in our continued efforts to press forward our Agricultural schemes.

173. I, personally, wish to express my thanks to the staff of this Department for their unlimited energy and support.

W. G. LECKIE,

*Director of Livestock & Agricultural Services*

With the Compliments  
OF THE  
Director of Agriculture.

AGRICULTURAL DEPARTMENT,  
MASERU,  
BASUTOLAND.



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