A Range Land Rental System Based on Grazing Capacity and the Price of Beef

J. A. CAMPBELL, *Grazing Land Appraiser*, AND V. A. WOOD, *Director of Lands*
Department of Lands and Forests, Edmonton, Alberta, Canada

IN THE Province of Alberta public controlled lands are administered by the Department of Lands and Forests. Approximately four million acres are leased for grazing purposes. This does not include grazing lands within the forest reserves.

Grazing rights on public lands are granted for periods of from one to twenty years. The shorter term leases are granted on lands that are regarded as partially fit for cultivation or likely to be included in an irrigation project to be established in the near future. However, most grazing leases are entered into for a period of twenty years.

Since 1937 rent and taxes have been collected in one sum by the Department of Lands and Forests. Fifty percent of total collections are transferred to the General Revenue Fund of the province; 25 percent to the municipal or local improvement district within which the rentals are collected; and 25 percent is devoted toward educational purposes.

Prior to the introduction of the new rental scheme in 1945, all rental and tax levies were on a flat rate per acre basis. This, the rancher felt was inequitable, particularly in years of low forage production and depressed prices. Therefore, with some change in mind, a resolution was passed by the members of the Short Grass Stock Growers' Association at a meeting in Medicine Hat held on May 26, 1938, suggesting that the Government of Alberta conduct an investigation into the question of grazing lease rentals. The association appointed a committee of three ranchers with the then Provincial Grazing Appraiser, C. Graham Anderson, the fourth member. The committee was asked to study the problems of ranchers faced with fixed rental dues and reduced pasturage, as a result of drought and low prices of beef. Mr. Anderson, the grazing appraiser, made an information collecting trip to various points in Montana, Wyoming, and Colorado and interviewed a considerable number of well-informed authorities in regard to the problem. The committee reported back to the association in 1940. It was proposed that grazing rentals, including taxes should be a variable amount determined annually on the basis of the amount and value of the beef produced from an acre of land, the two variables being the price of beef and the grazing capacity of the lands.

The Formula

A simple formula was proposed by which the rental due in any particular year might be readily determined. It was as follows:

$$\frac{1}{10} \times \frac{250 \times P}{G.C.}$$

= Rental & Taxes per acre

$\frac{1}{10}$ = share of total forage value retained by government as taxes and rental.

Where 250 = annual gain in pounds of beef on grass
P = price of beef
G.C. = Grazing Capacity (Acres per head)

Thus, one-tenth of the estimated an-

nual rate of gain of cattle on grass in pounds of beef per head, multiplied by the weighted average price of all classes of cattle (except fed calves) on the Calgary market from July 1 to December 31 in the preceding year, divided by the number of acres required to carry a mature head of cattle on the range for 12 months gives the rental per acre.

For example, with the price of cattle at 10 cents per pound the rental rate per acre in the short grass area of southern Alberta that will carry one head to 50 acres would be $\frac{1}{10} \times \frac{250 \times 0.10}{50} = 5$ cents per acre.

The government accepted the report of the committee, although the granting of the 10 percent royalty came under discussion as most other royalties on natural resources are set on a 12.5 percent basis. However, as a concession, to initiate the scheme the 10 percent royalty was accepted for a period of at least five years. It is now the intention to increase the royalty to $12\frac{1}{2}$ percent commencing January 1, 1952.

The figure of 250 pounds net gain per head on grass was accepted as a fair figure. Results from the work at Manyberries show that the net gain is in the neighborhood of 300 pounds, but it was felt that the 250 pound figure would allow some compensation for natural losses and for the maintenance of bulls and breeding cows over a possible winter feeding period.

The weighted average price of cattle on the Calgary market is taken for the last six months of the year, as that is the period in which grass-fed cattle are marketed. In the first six months of the year most of the cover crop and feed lot cattle are marketed and it was considered that these classes should not be included in the price determination. Due to the fact that all lease rentals are paid in advance before March 31st of the current year, it was found necessary to base this year's rental on the price of beef for the last six months of the preceding year. This creates a price lag which is possibly not entirely satisfactory.

The Calgary market is the principal market in Alberta for the marketing of range livestock.

Prior to 1934 no attempt had been made to zone the grasslands as to productivity and as complaints were frequently heard an attempt was made to evaluate grassland on a soil classification basis. This was undertaken by one of the staff of the Soils Department at the University of Alberta. This did not work out well for a number of reasons, including the fact that the areas indicated were too small, usually about nine townships in extent and 66 feet road allowances were used as boundaries.

Grazing Zones

Before introducing the new rental system it was necessary to establish the grazing capacities of the lands under lease. This was done in 1944 by the present grazing appraiser.

Four principal grazing capacity zones were established; namely, zones that will carry one head of mature cattle for each 24, 32, 40 and 50 acres respectively. These zones were based on the results of studies carried out at the Range Station, Manyberries, Alberta and the Experimental Station, Swift Current, Saskatchewan and information secured from ranchers in the various zones. In all cases, 12 months of actual grazing or its equivalent, is indicated i.e., 2 head may be grazed for 6 months, in place of one head for 12 months. Besides the above zones, other grazing capacities have been set by inspection for individual ranches at rates varying from 20–80 acres per head.

To protect the range and to help provide against feed shortage in a dry year,

a 45 percent carryover of grass is allowed in estimating carrying capacities. Moreover, the capacity of any ranch to carry livestock may be determined or adjusted at any time, either on the initiative of the department or on application of the lessee.

The 24 acres per head zone occupies the foothills area on the eastern side of the Rockies and is dominated by rough fescue with Parry oatgrass, Idaho fescue, intermediate oatgrass, wheatgrasses, June grass and sedges as subdominants (see list of plant names at end of this paper). This type has an average annual forage yield of approximately 700 pounds per acre, equivalent to about 30 pounds of beef. This may seem a light rate of grazing for this type of land but it is found that the dominant rough fescue goes out very quickly if heavily utilized and for this reason the grazing intensity and rental charges should not be considered comparable to those of the other zones.

The 32 acres per head zone occupies the transition zone, between the foothills grassland and that of the so-called Short Grass Plains. It is dominated by wheatgrasses and porcupine grass with bluegrasses, sedges and remnants of rough fescue as sub-dominants. This type has an average annual forage yield of approximately 425 pounds per acre, equivalent to about 18 pounds of beef.

The 40 acres per head zone is confined largely to that tension zone between the southern grassland and the northern forest. It is a parkland type with tension produced by invasions of willow, aspen, poplar and the climax white spruce. As is readily seen this is a very variable type, with the grassland dominated by the wheatgrasses, porcupine grass, bluegrasses and sedges. Woodlands are dominated by rye grasses, bluegrasses, vetches and peavine. This type has a productivity on the average slightly less than that of the 32 acres per head zone or equivalent to about 16 pounds of beef.

The 50 acres per head zone occupies the greater part of the grazing area of the province. It constitutes the dry treeless plains and is dominated by blue grama with sub-dominants including needle-and-thread, blue joint, June grass and Sandberg bluegrass. This type has an average productivity of approximately 265 pounds of forage per acre equivalent to about 12 pounds of beef.

Results Following Application of Formula

The recommendations of the grazing rates committee were put into effect as from January 1, 1945. As a result revenues from grazing lands have increased greatly (Table 1). This has largely been due to the rise in the price of cattle and a larger share of the rental coming to the taxing body than previously. So far, the rancher has felt no benefit in a financial way as the scheme was introduced on a steadily rising market. However, the zoning of the grasslands and the setting of carrying capacities allowing for a carryover from year to year has produced definite improvement in the conservation of the grazing resources. Many ranchers

TABLE 1

Beef prices compared with tax and rental charges by years

YEAR	BEEF PRICES PER POUND	TAX AND RENTAL CHARGE PER ACRE			
		Acres per head			
		24	32	40	50
	Cents				
1933	2.35	2.40	1.83	1.50	1.18
1934	2.17	2.30	1.70	1.40	1.08
1939	5.07	5.30	3.96	3.20	2.54
1940	5.77	6.00	4.50	3.60	2.88
1945	8.88	9.25	7.00	5.50	4.50
1946	8.90	9.25	7.00	5.50	4.50
1947	10.15	10.50	8.00	6.25	5.00
1948	10.94	11.50	8.50	6.75	5.50
1949	16.57	17.25	13.00	10.25	8.25
1950	16.03	16.75	12.50	10.00	8.00
1951	24.24	25.25	19.00	15.25	12.00

state the scheme has convinced them of the value of well-maintained grass cover. They may not carry so many cattle but they do maintain their livestock in better condition than previously. Many feel that as the grazing costs them more than in the past that it is to their advantage to make the best use of the grazing by producing fewer but heavier cattle, by increasing the calf crop, by lowering winter losses and by feeding less supplemental feed.

There have been relatively few requests for adjustment in grazing capacity, amounting to less than 2 percent of the number of leases held. Most of these have been located adjacent to the boundary lines between zones or in areas where rock outcrop, gravel ridges or heavy brush, influence forage production.

These requests for adjustment in grazing capacity have been dealt with apparently to the satisfaction of the parties concerned. Hence a three-man appeal board on which the Western Stock Growers' Association has a representative, has not been called upon to decide a single case.

Problems Requiring Further Consideration

Introduced for a trial period, the scheme is now operating in its seventh year and as is to be expected problems have been encountered.

Since the inception of the scheme it has been the intention of the administration to set the grazing capacity of each individual ranch held under lease and while this has not been completed progress is being made each year.

Unless requests are received for individual ranch inspections with respect to a possible change in grazing capacity, the procedure at present is to set the grazing capacity when a grazing lease is subject to renewal. With 2,000 long term grazing leases in effect a considerable number of leases come up for renewal each year. During this inspection, the grazing capacity is adjusted if considered necessary by taking into account species present, indications of overgrazing, amount of brush present, non-productive areas and other factors. These inspections are carried out in company with the lessee who is encouraged to make his representations gained from his intimate knowledge of the lease.

As stated previously, grazing capacities were set up to allow for approximately a 45 percent average carryover of grass. The reason being, that a better growth of grass would be encouraged and in event of a dry year there would be enough old grass, together with the new, to maintain the number of livestock carried, so that the herd would not have to be reduced.

However, in event of two successive dry years, it would be necessary for a rancher to reduce the number of his herd or else provide supplementary feed. Such being the case compensation would be due the rancher for his decreased grazing capacity, according to the formula.

The main problem would be delimiting the area affected by drought to an extent to warrant compensation. It would be almost certain that numerous requests would be submitted by lessees on adjacent lands to show cause why they should not be included in the drought compensation awarded to others.

Before consideration would be given to a lessee's request for a reduction in rental, it would be necessary for him to make a statement under oath that the lease was grazed at the recommended grazing rate during the years previous to the request and further that he has definitely cut to the number grazed in the year of the request.

One possible method would be to lower the grazing capacity still further and increase the amount of carryover with the understanding that no variation in graz-

ing capacity would be considered except under extreme conditions. However, this method would have its limitations too, since carryover soon loses its nutritive value and disintegrates. Ranchers too would certainly be irked in years of good prices and abundant grass to have their herd number held down to an average figure.

In all probability, most ranchers would prefer to carry on at the present grazing capacity rates while the present prices continue and take a chance on having to purchase supplementary feed on the possible rare occasions when successive drought years occur.

With regard to allowing the range to rest at periodic intervals, permission is given to do so for a period of one year on condition that the full rental is paid. It has not been found good policy to extend this period, as ranchers who have sold off their stock and consider prices too high to buy in again have tended to take advantage of the opportunity to rest their lease. The net result of too long rest periods is that adjacent ranchers complain about badly needed grass going to waste and requesting cancellation of the lease of the adjacent rancher and the grassland made available to themselves.

As a check on the number of livestock carried on a lease, lessees may be required from time to time to make a sworn declaration to this effect.

Allowance is also made in the scheme for loss of grass through prairie fires, the extent of the compensation being influenced by the time of the year and severity of the burn. No claims have yet been presented to the department in the six years of the scheme, although a few small local fires have occurred, mostly caused by locomotive engines. These claims have been met by the railroad without reference to, or representation by the department.

Conclusion

In conclusion it may be stated that there is nothing essentially new in this scheme as it is a variation of similar plans developed earlier in the United States.

From the standpoint of the rancher, he is paying more for his grass than he has ever done before but at prevailing prices he feels he can afford to do so.

From the viewpoint of the administration, revenues have increased sharply from $128,000 per year in 1937 to over $250,000 in 1950. It is generally agreed too, that the ranges are in better condition than prior to the introduction of the scheme.

It is realized that further study is necessary to secure information required to add refinement to this scheme. Such steps are now in progress.

NAMES OF PLANTS MENTIONED IN THE TEXT

Rough fescue	*Festuca scabrella*
Idaho fescue	*Festuca idahoensis*
Parry oat grass	*Danthonia parryi*
Intermediate oat grass	*Danthonia intermedia*
June grass	*Koeleria cristata*
Needle and Thread	*Stipa comata*
Porcupine grass	*Stipa spartea* var *curtiseta*
Blue grama	*Bouteloua gracilis*
Sandberg bluegrass	*Poa secunda*
Bluegrasses	*Poa* spp.
Hairy wild rye	*Elymus innovatus*
Bluejoint	*Agropyron smithii*
Wheat grasses	*Agropyron dasystachyum*
	Agropyron griffithsii
	Agropyron subsecundum
	Agropyron spicatum
	Agropyron pauciflorum
Sedges	*Carex* spp.
Vetch	*Vicia americana*
Peavine	*Lathyrus ochroleucus*
Willow	*Salix Bebbiana*
Poplar	*Populus tremuloides*
White Spruce	*Picea glauca*