The Black Wattle.

The name of Black Wattle is restricted in South Africa to the Acacia mohlin-sima, while the Acacia decurrens (old variety, normalis), is called Green Wattle, and the Acacia dealbata is known as Silver Wattle. These three species are very closely allied.

Black Wattle Bark in Natal Midlands.

The total amount of moisture in the green bark (mature) is approximately 53 per cent., the greatest proportion being usually in the bark from the middle portion of the tree.

The loss of moisture when drying green bark under natural conditions, from mature trees, is about 49 per cent. of the original weight when drying out under fairly ideal conditions in the open.

When green bark is packed fairly tightly in open boxes it loses in transit on an average about 6 per cent. of its original weight in one day, about 11 per cent. in two days, and about 16 per cent. in three days. On these figures it may be stated that 100 lb. of air-dried stick bark would be equivalent in value to (1) 187 lb. of green bark newly stripped, or 2) to 176 lb. of green bark after one day in transit, (3) 167 lb. of green bark after two days, and (4) 157 lb. which has been in transit for three days. It has, unfortunately, not hitherto been possible to carry out experiments under practical conditions to verify these figures.

The average weight of air-dried bark obtained per tree varied from about 8 lb. for one of three year old trees up to approximately 40 lb. from a nine year old tree. The average percentage of tanning matter in bark from trees between these specified ages does not vary a great deal.

In a comparison between bark from trees of the same age taken from the same plantations. There is a decided decrease in the percentage of tannin in the bark as we ascend the tree, so that the bottom third of the trunk contains usually more than half the tanning matter obtainable from the complete tree.

Although the average percentage tannin content for any particular thickness of bark seems to be greatest in young trees, it may be stated that for trees of all ages (from three up to twelve years) the thickness of the bark can be taken as a good guide to its richness in tanning matter.

Black Wattle Bark on the North Coast of Natal.

The development of the trees, and the weight of bark obtained per tree, are very much inferior in trees from the Coast plantations as compared with those of the same age from the Midlands of Natal. The Coast trees seem to mature more quickly, and the percentage of tanning matter is generally higher for trees of corresponding ages, but the total weight of tanning matter per tree is on the average less than half that from a tree of same age in the neighbourhood of Cedara.

Black Wattle Bark from S.E. Transvaal.

Where the soil is deep and of good texture, the yield and quality of bark obtained from this district seems to approximate those from the Midlands of Natal.

Miscellaneous Information concerning the Black Wattle.

No appreciable loss of tanning matter is experienced during the artificial drying of bark, so long as the temperature of the oven does not exceed about 150 degrees F.

During the harvesting and drying the inner side of the bark should not be exposed to the sun's rays and the weather generally for this causes a reddening of the bark, although it is mostly superficial. If due care has been taken in the harvesting it should be of a straw colour or a light brown throughout. For a mature tree the yellow is about 4 units, and the red 5 units. Bark from younger trees is lighter in colour as a rule.

The coarser fibrous material is lowest in soluble matter and particularly in tannins, the very finest powder being the richest.

It would not be an economical proposition to utilize very young trees (about a year old) in the manufacture of extract, as the amount of tannin present in the various portions of the tree is very low; even the bark itself contains only about 4 per cent. of tanning matter.

The bark from the bigger branches of mature wattle trees compares fairly well in tannin content with the bark from the top portion of the main stem.

In twigs and leaves from mature wattle trees the amount of tanning matter is very low, being only about 4 per cent. The extract prepared from this source contains more non-tans than tans. It is possible that such extract could be used with ordinary bark extract to moderate its astringent action.

In regard to "Mottling," the amounts of tannins and soluble non-tannins in the diseased areas are usually appreciably less than in the sound bark in the immediate vicinity, while the colour of the infusion is also invariably darker. The deterioration, however, is not so marked as what might be expected from the appearance of the bark.

There is a decrease in weight of soluble matter through leaching, but the loss is chiefly in the non-tans. The consequence is that the actual percentage of tanning matter in the "weathered" bark is often higher than in the unweathered. The deepening of colour is mainly superficial, and the colour of the infusion obtained from it is usually lighter than from the unweathered bark.

There is an appreciable diminution in the amount of soluble matter originally present in the bark owing to the growth of moulds on it, but it is the non-tans that are chiefly affected, so that the actual percentage of tans in the mouldy bark may be even greater than in the portion of the bark not subjected to mould. There is a marked deepening of colour (particularly in the yellow constituent) as a result of the action of the moulds.

In "sweated" bark the colour appreciably deepens, but there does not seem to be any increase in tannin in the composition of the bark.

The tannin content of wattle wood is very low—less than 1 per cent.—and so would not repay extraction.

Wattle Extract.

In boiling tannin liquor under ordinary pressure the amounts of tannins and of soluble non-tannins in the infusion are diminished, but the deterioration takes place chiefly in the colour. It is therefore obvious that the method of concentrating liquors in open vats when preparing wattle extract is very unsatisfactory.

Regarding the effect of keeping tannin liquor for a length of time, in case of weak liquors freshly extracted from the bark a large amount of the diffusely soluble bodies—chiefly non-tans—was soon precipitated (within the first day or so). In case of liquors of
Soil Erosion.

The heavy rains of the latter half of the season have in many areas caused considerable damage by the washing away of soil and the formation of sluits and dongas. The attention of farmers has frequently been directed to the widespread damage caused by soil erosion, and to the fact that up to the present little or no concerted or individual action has been taken against this insidious evil.

The coming dry season offers to all farmers a chance to repair, to a certain extent, the damage done, and what is more important, to take measures to prevent as far as possible in the future the ravages of soil erosion on their farms.

Very steep land likely to wash away easily should not be worked, but protected with grasses or trees.

Storm water should be prevented from washing over cultivated lands from adjoining uncultivated areas. While this will in many cases require the services of an engineer and involve a large outlay, in some instances much could be done on a small outlay. The storm ditches can well be excavated at a large outlay, in some instances much could be done on a small outlay.

Save Cultivated Lands.

Heavy downpours of rain often cause serious erosion in cultivated lands. Much has been done in other countries to prevent this damage by the construction of what are variously known as mangum terraces, ridge contours, or ridge terraces. These are low ridges of soil, which can be planted with crops, constructed for the purpose of leading water off the land at a specified slope. They can be cheaply constructed, and if well maintained, are very efficient.

Dongas or sluits already formed can be reclaimed in several ways, or if they are very large and deep and past the reclamation stage, attempts can be made to prevent further damage.

In fact, it has been the experience of farmers in the Karroo and elsewhere that very few dongas are beyond reclamation. The expenditure incurred by the construction of proper weirs across dongas has almost invariably been justified by the resultant silting up of the donga and all its tributaries, thus producing (one might almost say "creating") large tracts of excellent grazing veld in some cases, or deep, fertile, irrigable, soil in others; and, in addition, preventing the further erosion of probably hundreds of acres of good veld on the higher slope.

More Vegetative Cover.

The vegetative cover of watercourses should be disturbed as little as possible, while grass and tree planting should be done to protect and bind the soil where erosion is likely to occur and to prevent the encroachment of eroded areas.

Attention should be given to farm roads and pathways, especially abandoned ones. Many dongas originate from old roads. In combating soil erosion prevention is better than cure.

There is also denudation of the natural veld by overstocking, overgrazing, veld burning. We should have more paddocks and fewer kraals. Unless we control our grazing (for similar reasons and in the same way as we rotate our crops) we run the risk of exterminating our most valuable natural grasses and shrubs, of losing our best soil and of slow but sure desiccation.

Our soils are a priceless heritage and must be preserved and improved. Farmers who take active steps to prevent erosion are doing a great service not only to themselves but to posterity.

FARMERS OF THE ORANGE FREE STATE AND BECHUANALAND! Look out for the Demonstration Train—Lectures, Demonstrations, and Exhibits.

Bring your family, and do not miss the opportunity of visiting this Agricultural School on Wheels.

Also, tell your neighbours that the train will be at—

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The Black Wattle—Continued from previous page.

The proportion of mineral matter is greatest in the young growing portions of the tree (the small branches and leaves) and is also comparatively high in the bark, while the lowest proportion of ash is found in the basal portion of the trunk.

In the wattle wood removed from a one-acre plantation in a cycle of eight years there would be approximately 260 lb. lime, 170 lb. potash, and 20 lb. phosphoric oxide. In the bark removed there would be about 170 lb. lime, 60 lb. potash, and 1 lb. phosphoric oxide. In the whole cobs from good crops of maize there would be removed per acre in eight years approximately 10 lb. lime, 100 lb. potash, and 150 lb. phosphoric oxide. Therefore the maize crop draws considerably less lime and potash, but far more phosphoric oxide, from the soil than wattles do.

Manural Value of Spent Bark.

The ash of spent bark varies very considerably both in amount and in composition according chiefly to the process of extraction adopted. The average of several samples of spent bark showed that 70 per cent. of the ash consisted of calcium carbonate (carbonate of lime), the amount of potash being under 4 per cent, and the phosphoric oxide about 1 per cent. Such material could be used instead of ground limestone for agricultural purposes, and would have the further advantage of supplying small amounts of potash and phosphate.
Droughts made Powerless.
Maintaining Sheep in Condition through Prolonged Drought.

It is to be expected that the drought problem will be a subject of frequency in circles where farming is the chief interest. The Department constantly strives to throw light on the subject, and the notes that follow will show some of the directions in which it is endeavouring to find for farmers an escape from the distress and difficulties of the dry periods. And let it be understood that these dry periods are a normal feature of our climatic conditions. The problem is thus one of ascertaining the best farm practice to follow in the areas where such conditions prevail.

Feeding Experiments at Graaff-Reinet.
It will be interesting to observe in how far these theoretical considerations are substantiated by actual feeding trials that have been recently undertaken at Graaff-Reinet, the following being a brief review of the position up to the 19th December, 1927, there:

A comprehensive set of experiments is now in progress at the Prickly Pear Experiment Station at Graaff-Reinet, with the object of—

1. determining the cost and practicability of clearing spiny cactus ("Prickly Pear") infested veld by feeding the plants to sheep;
2. the amount of this spiny cactus which it is necessary to feed, and the different amounts of supplement required in order to produce satisfactory results both with ewes with lambs and hams.

The bulk of the sheep are fed according to the following systems:

1. Spiny cactus chaffed and fermented.
2. Spiny cactus chaffed and not fermented.
3. Whole joints ("leaves") after singeing off the thorns.
4. Growing plants grazed after singeing off the thorns.

All these rations are supplemented by about 1 lb. of lucerne hay per day. The average consumption of spiny cactus per day has been from 11-13 lb. The original intention was not to water the sheep, but a limited amount of watering has had to be done on account of a severe drought which caused the plants to lose a great deal of their succulence.

Results as shown by Feeding Experiments.
The experiments have been in progress for one year. The results so far indicate that—

1. grazing is not as satisfactory as the other methods of feeding. This is due largely to the difficulty in completely singeing off the thorns especially those

Drought-resistant Crops.
A first consideration is naturally the provision of drought resistant crops and of succulent fodder for livestock, such as spineless cactus and silage. At the Grootfontein School of Agriculture, which serves the semi-arid Karroo area of the Union, many experiments have been carried out and much valuable experience obtained in the matter of providing for the dry periods. Farmers will remember the interesting account of sheep being kept alive for 180 days, solely on prickly pear with occasionally a small allowance of lucerne hay, and no water. The fame of this experiment has, indeed, spread to other lands, where its lessons are being put into practice.

It may be mentioned here that for an average ewe, producing milk, 12½ lb. cactus plus 1½ lb. lucerne hay, will be in the nature of a maintenance ration and, although this ration cannot be recommended for any great length of time, it will nevertheless be of great use during periods of drought or during the winter.

Grootfontein School of Agriculture in the Semi-Arid Karroo Area.
on the fruit. Another disadvantage, under the conditions of the experiment, is that the ground is not cleared of the cactus; (2) 48-hour fermenting has not proved successful. Fermentation for 12 hours has, however, proved beneficial during the fruiting season in the case of chaffed spiny cactus by softening the small thorns on the fruit; (3) chaffed spiny cactus has proved superior to singed uncut joints; (4) a ration of 11-13 lb. of spiny cactus per day supplemented by 3 lb. lucerne hay has so far proved a satisfactory maintenance ration. On these amounts the sheep have on the whole maintained their weights, hopeful that such will be possible, particularly in the treatment of the lambs. There seems no doubt that whatever the condition of the veld may be, good results at no enhanced costs may be expected by a commonsense method of feeding. In this respect the value of mealiw will be demonstrated. Sheep running on drought parched veld fed on 4 oz. mealiw per day (equal to ½ bag per annum) and getting a liberal water allowance, gave outstanding returns. With mealiw at 10s. per bag it would thus cost 5s. per annum to feed a sheep. Here is a simple matter of economics. Is it not better to spend 5s. on feeding the sheep, obtaining a return of from 10s. to 15s. for its wool, than to subject it to the disasters of trekking? Without question, with sufficiency of water, mealiw are an outstanding feed. But this is not the only way. With a couple of morgen under spineless cactus in each sheep camp (established in 3 years) the farmer will be insured against the worst drought. Losses will be small for the cactus will not only provide food, but, if it be abundant, will mitigate to a certain extent, the distress of any water shortage.

Use Common Sense with your Sheep.

In regard to the use of prickly pear, transport is one of the chief costs, and Mr. Smith, of the Groofontein School of Agriculture, has drawn attention to an economical method employed by Mr. O. Olivier, De Hoop, Kendrew, who has mounted his cutter on a low carriage which is attached to and worked by his tractor. The tractor is then driven into the infested area and the sheep is cut up on the spot, and the sheep, following in the trail of the tractor, eat the pear as delivered from the cutter, and so transport is eliminated.

Now, in the matter of feeding sheep, the farmer must use his common sense, that quantity to be fed depending upon the condition of the veld, and of the sheep, the available water supply, and the possibilities of quiet grazing. The chief thing to avoid is to allow the sheep to become low in condition before starting to feed; the building-up will be found slow and expensive. Therefore, every effort must be made to provide, at all times, sufficient water and quiet grazing (under which conditions the sheep will need far less feed) and to avoid moving the animals long distances. As a general rule, however, the 4-oz. ration will go a long way with sheep that are grazing free to keep them sound and healthy.

Practical Results Obtained by Farmers.

These remarks are not mere theories. Although the experiments now in progress may indicate modifications or otherwise, it is clear that in the main the practice of feeding outlined above is the farmer’s means of overcoming drought. Evidence thereof comes from Aberdeen, a district sorely tried by the recent drought. There Mr. D. M. H. Featherstone fed 900 sheep on 4 oz. mealiw each, and practically nothing else, apart from what they could pick up on the very dry veld during mid-August to mid-October, and since then only 2 oz. mealiw; and the animals are doing well. Mr. I. J. van der Merwe has fed 500 sheep on 2 oz. mealiw and 1 lb. green lucerne (equal to ½ lb. of lucerne hay) and obtained excellent wool and satisfactory lambing.

These are instances: the experience of these farmers can be that of all who undertake sheep farming and have such facilities as regards water and camping that alone make that branch of farming possible.

Farmers are besought to keep in touch with the Department and the experiments now in progress, so that the distress that characterizes every spell of prolonged drought may speedily become a phantom of the past.

Respect the Soil.

In expressing appreciation of the great benefits derived by him from the course at the Groofontein School of Agriculture, a correspondent enumerates several things that he has been taught, which he is finding of every day practical help. He states that he has now learned to respect his soil and not, by overstocking his farm, to be an enemy to himself and to his country.