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DEPARTMENT OF AGRICULTURE OF WESTERN AUSTRALIA

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# CHANGES IN PASTORAL VEGETATION CAN PROVIDE A GUIDE TO MANAGEMENT

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# Changes in Pastoral Vegetation can Provide a Guide to Management

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Fig. 1.—Woollybutt grass (*Eragrostis eriopoda*) has almost disappeared from this plant community owing to continuous grazing. Note the dead butts in between the clumps of soft spinifex (*Triodia pungens*), which is rapidly taking over the area

**O**VER approximately half the area of Western Australia, stock are being grazed on the native vegetation—plants which, over the years, had adapted themselves to the soils and climatic conditions and which were growing in profusion when the white man first took his flocks and herds into the areas.

Such plants had probably been growing there for centuries, and the pastoralist was inclined to assume that they would continue to flourish.

Admittedly, the country was now called upon to carry a greater number of live-stock, but it appeared to be producing more than enough vegetation to satisfy their requirements. Even after years of fairly heavy stocking, most of it still carried plant populations that seemed to be more than adequate for the needs of the animals.

Despite this apparent wealth of pasture, however, the carrying capacity of many areas was declining rapidly, and it was found that this was caused by the

progressive eating-out of the more palatable and more nutritious species and a consequent increase in the less desirable plants in those areas.

In other words, although the quantity of pasture often remained more or less unchanged, the quality had deteriorated to an alarming extent.

## DEFERRED GRAZING.

To reverse this trend—in other words, to improve the quality of the vegetation—the practice which we have called “deferred grazing” has been advocated.

“Deferred grazing” has been tested under field condition; and undoubtedly gives results.



Fig. 2.—After burning the area shown in Fig. 1, seedlings of many species sprang up but were grazed off until only the soft spinifex remains. Deferred grazing would have prevented spinifex dominance

Briefly it consists of excluding stock from a portion of the run after the first rains, so that the plants can grow unchecked, and in due course mature and set seed. Under the normal conditions in our pastoral areas, this is only for a brief period—say about six weeks.

Once the seed has matured and commenced to drop, the stock are brought back into the area, preferably at a heavy stocking rate, so that the seed is trampled into the ground instead of being blown away or taken by birds and insects.

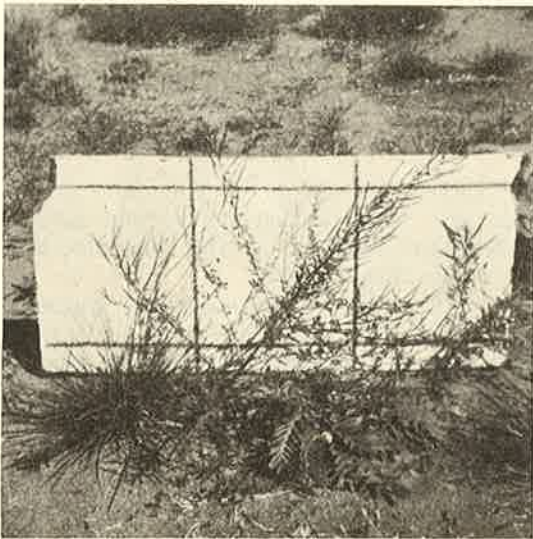


Fig. 3.—Tarbush or wild mustard is an annual which often appears after a burn. On well-managed country, the annuals usually give place to perennials in a few years. Where the annuals persist, the chances are that the quality of the pasture is still declining

## A SOUND POLICY

Deferred grazing is a sound policy that has been tried and tested by practical station men.

It is obvious that where stock are allowed to graze at will, they will concentrate upon the tastiest—and these are usually the most nutritious—plants. They will eat them back to such an extent that, not only will the plants fail to set seed, but they will have little or no opportunity to accumulate root reserves to tide them over the dry period.

Consequently many of these desirable species will die off and their places will be taken by other plants not relished by stock.

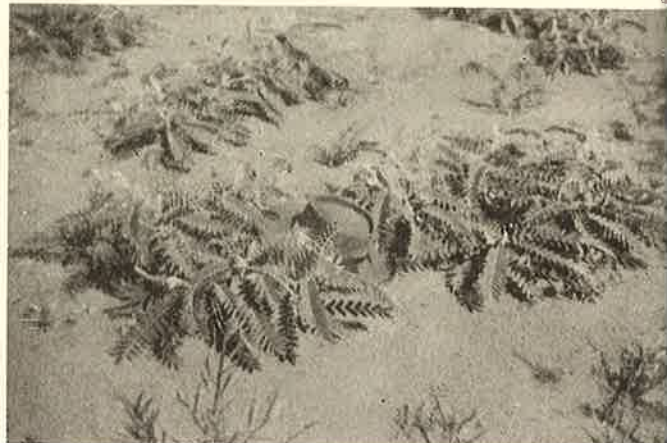
This is what has actually been happening for years in our North-West—and that is why the carrying capacity of many runs has shown an alarming decline. Many valuable native plants and grasses have gone from the plant population to be replaced by spinifex.

The nutritional value of spinifex is low. The better types will keep sheep alive, but something better is needed for pregnant ewes or to provide a milk-producing ration for ewes with lambs.

Deferred grazing allows the desirable plants to increase by setting seed, and permits the mature perennial plants to store up the necessary nutrients to carry them over the dry period.

Even after one application of the deferred grazing technique, it has been found that there was a marked increase in the proportion of the better types of pasture plants.

Fig. 4.—Cockroach bush, or emu bush as it is sometimes called, is an unpalatable plant which often appears after a burn but usually disappears within a few years. Persistence of this plant also indicates a downward trend in the quality of the vegetation





If a second spell of deferred grazing takes place during the next wet season, a still greater improvement in pasture quality takes place.

The ideal technique is to practice deferred grazing on a third of the run for two successive seasons, so that the whole area is given two treatments every six years.

### PASTURE CHANGES SHOULD BE CLOSELY STUDIED

During the deterioration or improvement of a pastoral area, the changes in the composition of the plant communities afford a valuable guide to management.

If these changes are carefully studied as they occur, it will be possible to apply deferred grazing in the areas where it will be most useful.

Grazing trials at Woodstock Station showed that the condition of the stock is a very unsatisfactory indication of changes in the quality of the pasture.

While they are wrecking the vegetation, the stock are apt to remain in good condition as they keep the grasses eaten down during the growing season and are subsisting on young, highly nutritious shoots coming up over an extended period.

As was explained earlier, the plants under continuous grazing are prevented from setting seed or establishing root reserves, so that serious damage is done to

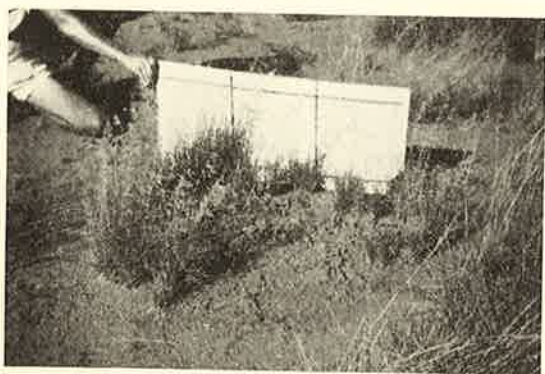


Fig. 5.—Woollybutt grass (*Eragrostis eriapoda*) is being allowed to seed by deferred grazing technique. When the seed commences to fall, the area will be heavily stocked to ensure that seed will be trampled into the ground and not blown away or removed by ants and birds

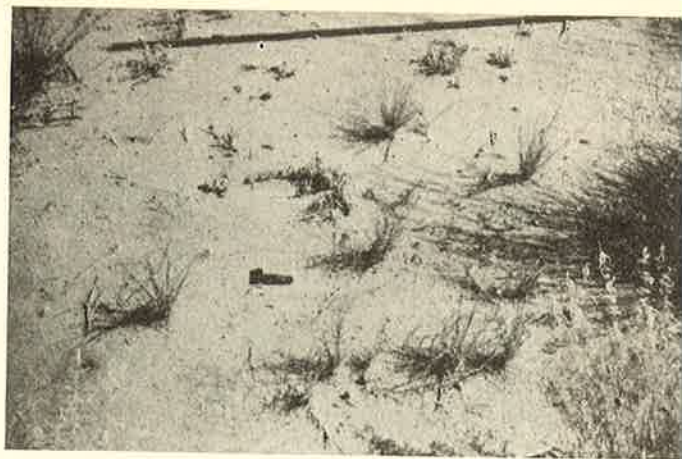


Fig. 6.—A good stand of grass seedlings after one season of deferred grazing. Stocking was at the rate of a sheep to three acres. Tops of mature plants may be seen in the right foreground

the pasture before the animals start to lose condition at the end of the growing season.

Under controlled grazing conditions on experimental plots at Woodstock Station, the sheep did not achieve such a high level of bodyweight as those on continuous grazing, but they maintained their condition throughout the year.

Furthermore, the quality of the vegetation was improving all the time.

Remember, that the practice of leaving stock in a paddock for as long as they continue to do well will have disastrous consequences for the plant community.

The photographs accompanying this article, illustrate some of the changes in vegetation which indicate good and bad pasture management.

In Fig. 1 it will be seen how "woollybutt grass" (*Eragrostis eriapoda*) a useful perennial, is disappearing from the plant community owing to continuous grazing. Only the dead butts remain. The less palatable and less nutritious soft spinifex (*Triodia pungens*) once covered about 50 per cent. of the area but is now taking over space once occupied by woollybutt grass.

Unless the woollybutt grass can be encouraged to persist, by deferred grazing the entire area will soon be occupied by spinifex only. The nutritional value of this spinifex is too low to support pregnant or lactating ewes.

If the vegetation in Fig. 1 is burnt and stocked after the seedlings have appeared, the only surviving seedlings (Fig. 2) will

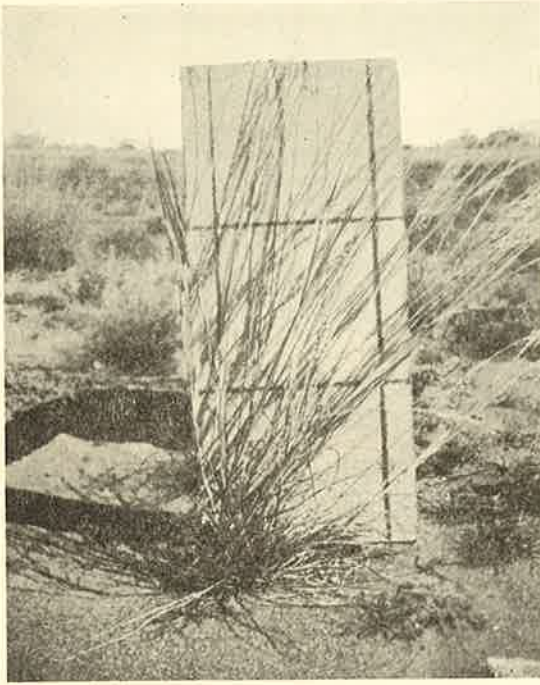


Fig. 7.—Perennial weeping grass (*Chrysopogon latifolius*), the most palatable of the local species

be those of the unpalatable species (in this case, soft spinifex). Deferred grazing would have given other plants a chance to become established and prevented spinifex dominance at such an early stage.

After the burning of spinifex country a number of plant species will usually germinate. Many are annuals which have their place in the normal succession after a burn. Tarbush or wild mustard, shown in Fig. 3 is one of these annuals.

If the country is managed correctly, the annuals will be replaced by the more useful perennial species within a few years.

If the annuals are still prominent after two or three fair seasons, the chances are that the vegetation is on the downward trend. This can be the result of too high a stocking rate or consistent stocking during the growing season. Even a low rate of stocking at this time can ruin good country.

Although tarbush is regarded as good feed, its persistence over the years is a bad sign.

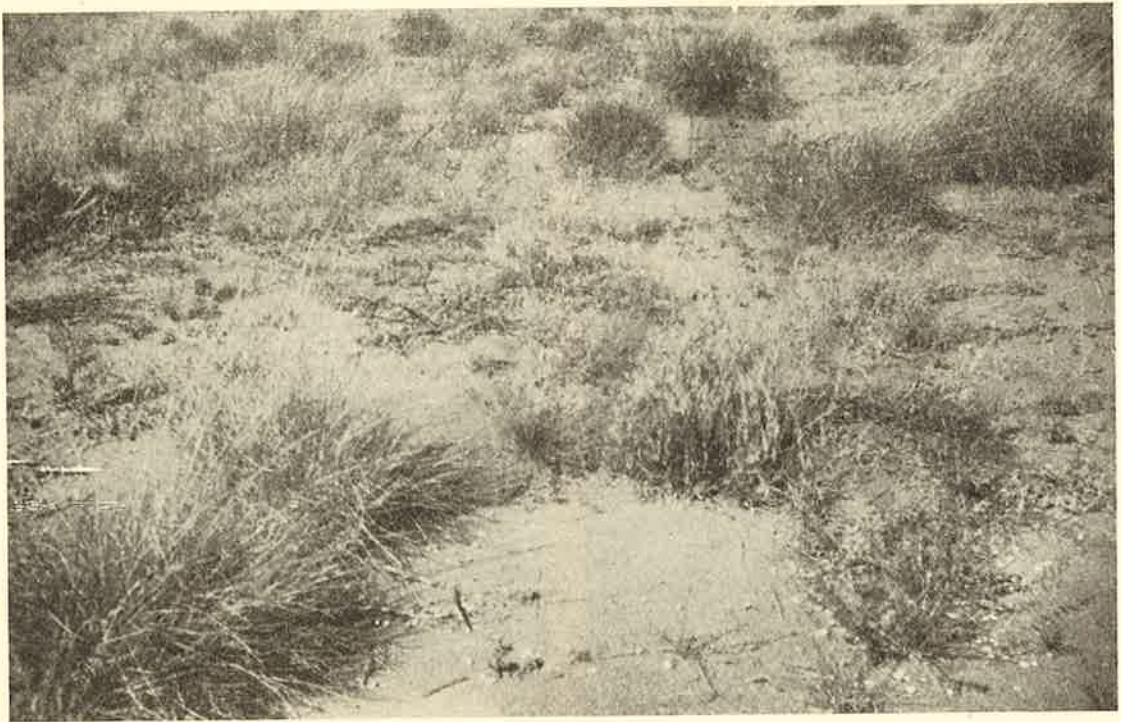


Fig. 8.—This is the same country as shown in Fig. 1 after receiving deferred grazing treatment for two seasons. It also carried a sheep to three acres but now contains a 50-50 mixture of perennial grasses and spinifex. In this condition it could carry breeding stock successfully.





Fig. 9.—Buffel grass has commenced to establish itself in the plough-furrows on this wind-eroded claypan

Another plant which, if persistent, indicates a downward trend, is cockroach bush or emu bush (*Cassia notabilis*) (Fig. 4). It often emerges after a burn, but usually disappears after a few years.

In Fig. 5 we see woollybutt grass (*Eragrostis eriopoda*) being allowed to go to seed, and Fig. 6 shows a good stand of grass seedlings emerging after one season of deferred grazing.

Fig. 7 shows perennial weeping grass (*Chrysopogon latifolius*) the most palatable of the local species. This grass re-established itself in one of the deferred grazing plots at Woodstock, although it had not been noticed in that area for some years. Being most palatable it is usually the first grass to disappear and the last to return.

At this stage however I would remind readers that we still know very little concerning the response of different plants—and this grass in particular—to the variable seasons experienced in this area. This climatic factor, superimposed on the grazing factor, may hide or accentuate the vegetation changes.

To illustrate the marked change brought about by two successive seasons of deferred grazing on the country shown in Fig. 1, I have included Fig. 8. This photograph shows a very healthy stand comprising perennial grasses and spinifex in approximately equal proportions. This was stocked at the rate of a sheep to three acres, and the vegetation would now be sufficiently high in quality to support breeding stock.

So far, this discussion has centred upon the mixed spinifex—perennial grass country. On the better grassplains, the result of overstocking is far more dramatic. In this case, the whole of the plant cover can be eaten out and as there are unpalatable species to take over, the ground is left bare.

Wind erosion on these bare areas, can remove several feet of topsoil, leaving vast “claypans.”

Contour or “checkerboard” cultivation, followed by controlled stocking has been used to reclaim these areas. The photograph (Fig. 9) shows buffel grass (*Cenchrus ciliaris*) becoming established on the furrows.

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