

SOME CONSIDERATIONS OF TIMBER AND WOODY WEED CONTROL IN PROPERTY DEVELOPMENT IN NORTHERN AUSTRALIA*

N. D. YOUNG†

This address will contain a number of personal observations, many of them unrelated. Any common theme, will at best be tenuous. Perhaps the recurring point is simply our astonishing, and in my view, worrying, lack of knowledge in this broad field of timber control, a field I hold to be important.

In some company any talk of tropical pastures immediately conjures up images of Siratro, setaria, glycine, pangola swards with perhaps fleeting flashes of Townsville stylo growing in native pasture. Of course we members of Tropical Grassland are not fettered by such blinkers and our deliberations range over much broader concepts of pasture production in the tropics. We are ever mindful of the tremendous role that native grassland species play in our tropical animal production—or are we?

Let me launch my first assumption—that in regions of tropical and sub-tropical Australia, in areas exceeding 25" of annual rainfall, few single factors can have greater total influence on grassland productivity than the degree to which some woody species are thinned or removed. The need to restate this assumption may seem surprising in that timber clearing, along with improvements in watering points and fencing, has been a basic pioneering step in land development from the very early stages of the history of our pastoral industries.

I am not stating that timber removal or thinning is necessarily always beneficial in its effects on productivity. Simply that it does have large scale effects on light, temperature, water, nitrogen and I suspect other mineral balances. It greatly affects temperature, humidity, and many other aspects of the microclimate at the ground surface.

If you accept this assumption then I find it disturbing that so little is known about this practice and equally alarming that the present workers in this field in Australia would barely make up a cricket team. I can state, but hardly boast, that while reflecting upon the theme for my address I have in a period as brief as 3 weeks, spoken to 75% of all workers in this field. A prodigious effort on my part when you consider how long it would take a worker in leaf area ratios, or nitrogen balances to hold personal discussions with 75% of his kindred souls.

Our depth of knowledge in the various interlocking aspects of this broad field is perhaps best likened to the analogy of a young man, a property developer, age 22, who faces his scrub block from the east, with few clues, a large heart, and a sharp axe. Twenty years later he emerges in the west with a wife, 4 kids, a bank overdraft and a blunt axe. Sadly much of the timber is still growing behind him. He takes some comfort from the knowledge that he is highly experienced, and is now fully qualified to tell the next generation, his oldest son, how to sharpen the axe. Before this jest is taken too seriously, let me be quick to point out that many areas have been successfully developed by this method.

On the other hand, lest you people become too complacent regarding the complexities of the problem, I must relate that I started my interest in this work as a young man with a sharp axe and ten chemicals in the Burnett in 1954. I worked on bloodwood and poplar box in a small section of the original bullock paddock on Ban Ban Station. It was settled in the early 1840's and records relate how in 1854, 100 years prior to my efforts, Chinese shepherds had devised special sheep skin pads, not unlike cricket pads, to crawl from tree to tree to frill low, which the early squatters thought was an effective way to permanently clear timber.

* Presidential address delivered at the Annual General Meeting of the Tropical Grassland Society on November 14th, 1973 at Brisbane.

† Dow Chemical (Australia) Limited, Milton, Brisbane, Q 4064.

I predict that unless we adopt a more rational approach to the whole problem, it is not unlikely that in the year 2054, a young man, possibly again of oriental origin will be clearing tree regrowth on the Ban Ban flats, the very area from which I published the final solution in 1954.

This is neither the place nor the forum for a speech of review. I would like therefore to simply speak to a few themes upon which I often reflect in my wanderings in the bush.

DEVELOPMENTAL ALTERNATIVES

The whole subject is a most complex puzzle. Economic, ecological and political factors all play a part. Any vision of trees simply preventing grass growth is an over-view which glimpses only the tip of the iceberg.

Seldom is one able to isolate the effect of any one factor. An interesting interaction is triggered off by the shortage of rural labour. There are many ways to thin timber including manual, chemical and mechanical. It is very difficult to get accurate rural statistics on almost any subject and quite impossible to get figures with much meaning with respect to rural labour. Some figures from the Bureau of Census & Statistics show a fall of more than 50% in temporary rural workers in all fields in the decade ending 1962 and this trend on 10 year averages has continued.

The traditional method of timber thinning is by grubbing and ringbarking but such practices have largely been replaced by basal spraying and chemical injection. Several hundred thousand acres of pastoral country are thinned by this method annually. The largest single threat to the continued use of this practice is the shortage and cost of this labour. The shortage is more significant than the cost and many pointers indicate an increasing shortage at least over the next few years. The chemical industry has reacted to this problem and steps have been in progress for some years now to develop chemicals which can be placed in widely separated injections. Success in this endeavour would ease the labour problem at least temporarily.

In some areas however, and these tend to be the more inland lower rainfall areas, the labour cost is such that graziers are resorting to mechanical clearing as "the" method of timber thinning. Mechanical clearing is often the most cost efficient, and as such should be the method of choice. While mechanical clearing was the only feasible large scale answer for brigalow, there are many areas where mechanical clearing could, I suggest, pose subsequent serious problems.

Moore, Walker and Robertson working at "Wycanna" near Talwood have shown how buffel grass can be introduced into poplar box country after selected trees have been killed by chemical injection. Buffel could similarly be introduced into disturbed ground, following pulling. However the extreme disturbance of native communities with pulling is not necessarily a good thing as many weed species can rapidly colonise such situations. How does this relate to shortage of labour?

On the local scene some reports of Tothill and Walker support the many overseas workers who have reported the influence exerted by the grazing animal on rate and absolute amounts of woody weed regrowth. Stocking rates can generally be quite markedly raised immediately following clearing. Indeed they should be if cash benefits are to be obtained from this almost guaranteed growth flush. But stocking rates need also to be substantially raised if they are to influence to any degree the density, type and speed of regrowth which almost inevitably follows.

In these somewhat more remote inland areas, mechanical clearing tends to occur in fairly large scale units. Factors which influence these units to be fairly large include:

- A. Periodic cash liquidity surpluses following a run of good seasons.
- B. Large scale plant operators tend to visit and work in these areas spasmodically.
- C. The operators require a considerable area to make it financially attractive to stop, unload and work their plants.

For these and other reasons a man west of Roma in a mixed poplar box—sandalwood association finds he treats no country for 5 to 7 years then pulls 3000–5000 acres in 2 weeks. It is simply not possible to adjust stocking rates to use the grazing animal as a regrowth management tool in this situation. Graziers know this; those that don't soon are brought to a harsh realisation of this truth. However the shortage of rural labour could force them into a management system of treating 5000 acres once every 5 years and not 1000 acres each year for 5 years. Obviously, selectivity in clearing and in thinning is much more difficult mechanically, but the shortage of one management tool, rural labour, may jeopardise the use of another management tool, flexibility in grazing intensity, and the net result could add to the complexity of regrowth control.

POLITICAL ASPECTS OF TIMBER CLEARING AS IT AFFECTS LAND DEVELOPMENT

Remembering my original assumption that timber clearing is a major factor influencing grazing productivity at least in what may be described as pioneering stages of development, it is perplexing to me to find various Government policies so difficult to define, to discuss, and at times to comprehend. On a Federal level the importance of this one aspect of rural development seems to fluctuate with the whims of fiscal requirements for a whole range of other social needs. Changes in Government seem to cause major changes in emphasis regarding the degree to which graziers should be encouraged to clear land or to maintain existing thinned pastoral areas.

If one regards the management of grazing forest lands as a long term project, the ecological effects of which, while largely undetermined, cannot be regarded as transitory, it is to me puzzling that economic policies can change so quickly between political parties both dedicated to the protection of our ecological heritage—whatever they mean by that phrase.

On a local basis, many state departments, but principally the Queensland Lands Department, are charged with, among other responsibilities, the long term well-being of our pastoral lands. The same department has, of course, many other great responsibilities outside grazing lands. Even rural lands, National Parks—relic areas, etc. fall within their trust. Other departments have greater emphasis on increasing productivity.

I don't find the aim of long term well being need in any way be incompatible with a parallel aim of increased productivity from these areas. In this day and age with world populations increasing, it seems difficult to imagine that we can reserve vast tracts of land with better than 25 inches of rainfall in some sort of cold storage for future generations of Australians to ponder upon pioneer style developmental problems. Yet it seems that decisions on whether to impose timber clearing clauses on development leases are largely empirical if not at times emotionally and politically based. The decision seems largely to be left to local officers who may, or may not be experienced in many, or in any of the numerous aspects of the ecology of a grazing system in an open woodland.

Overriding these considerations however empirical they may be, is a political consideration which at least in the past has been responsible for large scale timber clearing. In years past, large sums of relief money were channelled into local rural areas in times of economic hardship, even drought situations. Much of this money was spent on timber, an ideal expenditure, because:

1. It got to needy men.
2. It was earned and spent in the bush.
3. It killed lots of trees, which was a "good thing".

There are a few penickety woodland ecologists, to whom such a policy might be questionable, but fortunately as I mentioned, the number of such trained academics is

few, so they can't in this aspect of land development hinder our "progress" to any extent.

No statistics are kept giving data on such matters as amount of land cleared each year, total cleared land, amount of timber country with timber control clauses in force, or the proportion of our pastoral lands in which timber treatment is virgin or 1st, 2nd, 3rd or 4th generation regrowth.

Those who might be judged to be accountable for the compilation of this data are very conscious that little or none exists, but they point to the fact that nobody seems perturbed to any extent; certainly not sufficiently so to expend the resources necessary for its gathering.

EFFECTS OF FIRE

Along with mechanical and chemical methods, fire in some instances is clearly a useful tool in regrowth control. The role of fire in containing if not controlling woody weeds is well documented in overseas work. In keeping with most aspects in this field in Australia not much has been reported but Tothill and Walker (unpublished) have given local evidence of reduction of regrowth by fire.

In practice the effects of burning and grazing are usually confounded and it is not easy to separate their respective effects. Increased grazing pressure acting directly to suppress regrowth at the same time removes much of the fuel for subsequent fire. Heavy rainfall years with greatly increased grass growth may lower grazing pressure but this can be compensated by hotter fires in the following spring. Beyond a few feet high neither grazing nor fire exerts much influence on regrowth, perhaps at best postponing seed set and reinfestation, but Eucalyptus species are difficult to kill by burning alone.

With partial clearing for Townsville stylo, with increasing use of N.P.N. supplements, more and more of the annual flush of grass growth is finally harvested by the grazing animal. One assumes as these practices expand there will be less need for burning. Will this cause regrowth problems to intensify? Could there be a relationship between NPN supplementation and regrowth management? Presumably if stock numbers are increased in some relationship to the amount of country developed to Townsville stylo, then grazing pressures will help maintain regeneration at levels where productivity is not adversely affected. Where this was not done in coastal northern ti-tree country regrowth of 10 fold density destroyed the pasture within five years.

PROBLEMS

Few would contend that grossly inadequate resources of men, money and scientific probing have been devoted in northern Australia to timber and timber regeneration in native pastures on our pastoral lands. I suggest we can take little comfort nor credit for this state of affairs. It may have arisen from many causes. From simply the paucity of workers who are adequately trained to tackle this complex ecological, economic, political and social conundrum. Perhaps it arises from the belief that the largest enhancement is derived from total replacement of the native species with what have come to be regarded as "proper tropical pastures".

Certainly the largest absolute gains in production would result from such replacement but in many whole regions our pastoral industries are barely out of the pioneering phase and in this stage I doubt very much that the best economic development of such areas is in the total replacement concept for years yet.

Complex cash budgets incorporating discounted cash flows may be needed to best guide a northern property of 400 sq. miles where barbed wire and windmills are the latest bonus from the present beef boom. A few dollars per acre on each of 20,000 acres may result in better financial returns for at least the next decade than say 1000

acres of *Setaria* and *Siratro* with P & K etc. We simply don't know which are the most profitable alternatives.

The answer may best be found by research workers who at present don't crowd this field. Could it be that timber regrowth research programmes don't yield publishable data for many years, and that this tends to make young graduates look for other fields. Perhaps methods of recognition need review if we are to attract more workers to this problem. We have discarded the old populate or perish philosophy—could we examine again the publish or perish concept.

Whatever the cause, few I hope would take issue with my statement that those of us who are interested in this country's pastoral industries, those of us who may influence the degree or direction of future research programmes should look more closely at the benefits both short and long term of studying the problem in depth again so that we may develop for the first time a rational approach to the problems of and benefits from timber and timber regrowth control.