The Business Of Farming: Veld Management

It is not the situation but what you do about it that determines the future

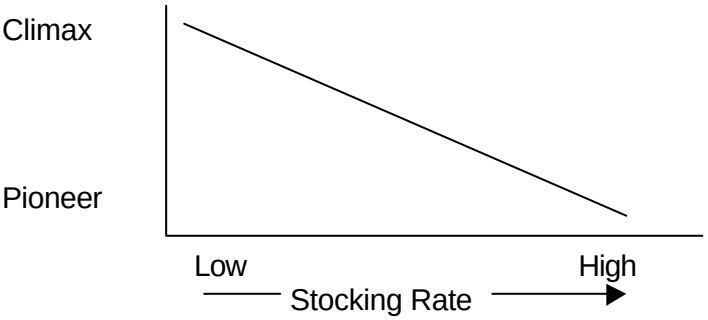
By S. D. Parsons

There is nothing as practical as a good theory. Like the shelves and hangers in a cupboard a sound theory provides structure for our thoughts. Take away the theory and, like the clothes, the thoughts fall in a heap on the floor.

But if the theory is not sound it will lead to erroneous conclusions and that is just what happened in veld management. For most of the 20th Century veld management reasoning has been dominated by a theory introduced by John Clements in 1916. The Clementsian model conceived on the prairies of Nebraska is only partially accurate and has unfortunately led to erroneous conclusions about the way that veld should be managed.

It was little over a decade ago that a world renowned Zimbabwean ecologist, Dr Brian Walker, and two colleagues offered an alternative theory that has entirely changed the way that I view veld management. Their State & Transition model has confined the simplistic management 'systems' like the four-paddock, three-herd system, and other simple 'recipes', to the rubbish bin.

Clements' model can be represented as a simple graph with stocking rate being the major factor determining whether grassland vegetation tends towards a pioneer or climax state. This model assumes that heavy stocking rates results in early successional, undesirable plants (weeds and annual grasses) and that the way to return grasslands to a climax state is to decrease stocking rate. Of course it would be nice if the world was that simple, but it is not.



Early critics pointed out that natural and managerial factors other than stocking rate alone determine the state of the vegetation. And as Walker and his colleagues point out rather than a smooth transition from one state to another the end result of particular actions is not easily predictable. Once a given state has been reached, it is often irreversible.[1] That is, most vegetation states are relatively stable and not easily changed.

A cup and ball theory has been proposed as a way of visualising such stability. Imagine that rather than being a straight line and a continuous transition from one

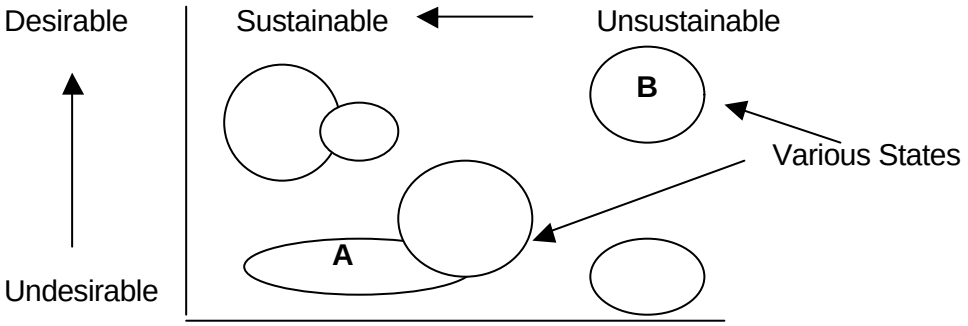
[1] Westoby, M., B. Walker and I Noy-Meir.1989. Opportunistic management for grasslands not at equilibrium. J. Range Management 42:266-274.

state to another there are 'pockets' representing various vegetation states. Deep pockets would represent vegetation like bush and trees requiring a great deal of energy to shift to a different state. On the other hand, annual weeds in a shallow pocket could be shifted fairly easily.

But even the cup and ball analogy is an oversimplification. So often the changes in our veld appear to have a will of their own. Whether it is an invasion of undesirable plants or just a general decline in carrying capacity, our attempts to change the direction often appear puny and futile.

The State & Transition (S&T) model proposed by Walker *et al* explains that there are many possible "biological states" (combinations of vegetation, birds, insects animals and microbes). Each state is the result of specific combinations of weather and management factors, both past and present. The key to veld management is to understand, and control as far as possible, the actions that will result in a desired state. That obviously is what we have tried to do through simple veld management systems, but with one hand tied behind our backs because of a limited theory.

Since climax vegetation may not be desirable from a stockman's point of view I prefer to replace the terms climax and pioneer with desirable and undesirable, and also to incorporate a measure of biological health. Thus I visualise the S&T model as a two dimensional matrix with health on one axis and desirability on the other.



Each State Being Influenced by
Many Natural & Managerial Actions

Each circle represents a particular biological state (grassland, pioneer grasses, heavy bush, vlei etc). Which state actually exists will depend upon past climatic changes (drought, good seasons etc) accompanied by past and present management factors – including stocking rate!

Thus, it is possible that heavy bush (State A) can be biologically sustainable but managerially undesirable. Planted pastures on the other hand (State B) could be managerially desirable but biologically unsustainable. Now before you pasture people get your knickers in a twist let me explain why I rate pastures as biologically unsustainable. Planted pastures only survive in a pure state when pampered with fertilizer, irrigation etc. Without man's constant input of fossil fuel energy they revert to a more natural state.

In the end result the long-term goal should be toward a healthy, desirable state – however that is defined by the individual manager. The Walker model suggests that veld management research should be targeted to an understanding of the *combination* of forces (transition pathways) that cause a shift from one state to another. Thus, a particular climatic event like drought might create an opportunity to shift to a more desirable state, but only if combined with specific managerial actions.

The right actions lead toward a desired goal while the wrong actions might well be disastrous.

The real work, and hopefully future research direction by our scientists, will be to identify the complex alternatives and to offer guidelines and principles for farmers to follow. Recipes don't work. In isolated case scientists have embarked on this mammoth task with some really useful results[2].

In a future article I will discuss some of the tools available to those interested in productive grazing management and the benefits it can bring to livestock and the bank balance.

[2]George,M.R, J.R.Brown and J.Clawson 1991. Applicationof Nonequilibrium Ecology to Management of Mediterranean Grasslands. J. Range Management 45:436-440.