'COVER STORY': A STUDY IN LAND MANAGEMENT

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This article summarises an environmental research project undertaken by pupils of Mondeor High School, Johannesburg. The project was entered for the Enviro '85 Competition where it won the Civic Awareness Section and was overall winner of the competition.

Just as Man uses clothes to protect and warm his body, the soil uses vegetation cover for the same purposes. The group was concerned with soil erosion and the associated effect upon the vegetation cover. The first stage of the project was to establish exactly which aspects of soil erosion should be studied. The following points were initially considered:

- soil types and characteristics
- different grasses and their carrying capacity
- suitability of grasses for grazing
- incorrect ploughing
- overgrazing
- run-off on different slope elements.

The group was assisted by an Agricultural Extension Officer. After becoming aware of the large volume of information available on these topics it was decided to limit the research programme to soil erosion and its relationship to vegetation cover. The research area was limited to the agricultural area surrounding Mondeor, a residential suburb on the southern fringe of Johannesburg. This agricultural area is known as Rispark.

The vegetation cover of the Rispark area was mapped in order to ascertain the degree of soil mismanagement present. (Refer to Figure 1). Large portions of the land had been burnt and 70% of the land contained *Stoebe vulgaris* (bankrotbos), clearly indicating soil mismanagement. About 47% of the land included some sweet grasses. Only one firebreak was evident.

The link between soil and vegetation is a very close one. If the veld is left ungrazed and unburnt, pioneer grasses will infiltrate the more desirable sub-climax and climax grasses. (Refer to Figure 2). Pioneer grasses which were abundant in the area included *Stoebe vulgaris*, an invader species from semi-arid regions. The soil in these areas was badly compacted and the porosity low, leading to increased run-off and accelerated soil erosion. Sub-climax grasses, *Digitaria* (finger grass) and *Eragrostis* (love grass) provide good soil cover and are favoured by cattle as they are sweet grasses. There was a fair amount of air and water spaces present in the soil where they occurred, allowing for reasonable infiltration by rain. The soil which was most porous and allowed the highest amount of infiltration was where climax grasses were present - *Themeda trianda* (rooigras) and *Hyparrhenia* (thatch). These grasses are sour and therefore not favoured by cattle, yet they offer the best soil cover. The link between the type of grass and the hardness of the soil is therefore vital. Once the soil is badly compacted, the infiltration by rain is severely limited and soil erosion is accelerated.

The only practical way to prevent veld fires from spreading is to construct firebreaks, which should be four metres wide and continuous. On 25th May 1985 firemen and volunteers took part in the burning of firebreaks in the Klipriversburg Nature Reserve. As this area was included in the study area, the group volunteered their services. The effect of these firebreaks has been advantageous to the Nature Reserve as, for the first time in many winters, the Reserve was not ravaged by fire.

Controlled veld burning can be advantageous, in terms of improving the type and quality of vegetation. If carried out after the first rains, in August or September, the period of vulnerability of the exposed ground will be minimised, thereby reducing the possibility of soil erosion. If vegetation cover is good, the land should be burnt once in three years. This will ensure that the subclimax (sweet grasses) remain available for cattle grazing. If veld burning is carried out too often pioneer grasses become prevalent, while if no veld burning takes place, the sour climax grasses predominate.

In order to educate the residents of the Rispark and Mondeor areas concerning the soil erosion problem, it was decided that:

a. Residents in Mondeor should be alerted to the soil erosion problems existing there.
b. Information regarding soil erosion should be supplied to farmers.

As most of Mondeor is situated on steep slopes, even the urban areas have severe soil erosion problems. A pamphlet was devised for the Mondeor residents and distributed in letterboxes. (Refer to Figure 3). It was designed to impart knowledge regarding the problems of soil erosion and to suggest solutions on combating soil erosion in gardens.

As younger people tend to be more flexible in their values and attitudes, talks were given to pupils in the Walkerville and Mondeor areas. For the junior pupils a story and colouring-in competition carried the soil conservation message across, while the more senior pupils were given a more detailed soil conservation plan.

Making the farmers more aware of the soil erosion problems was more difficult so it was decided to place informative posters in rural shops and supply centres. The posters were designed to impart knowledge and to stimulate interest as well as offering suggestions on dealing with the problems of soil erosion.

The problem of the abundance of *Stoebe vulgaris* was of major concern to the group and in order to en-

courage interest and publicity, a 'Bankrot Blitz' was planned. Permission was granted by the Peri-Urban Board for the group and other volunteers to dig out the bankrotbos on a large piece of land known as the 'Walkerville Commonage'. Banners were erected and, on 8th September 1985, a large contingent of concerned pupils, staff and volunteers cleared the field of some of the bankrotbos . It was a back-breaking task and although there will be no immediate major improvement, the group felt that their efforts and research were well rewarded.

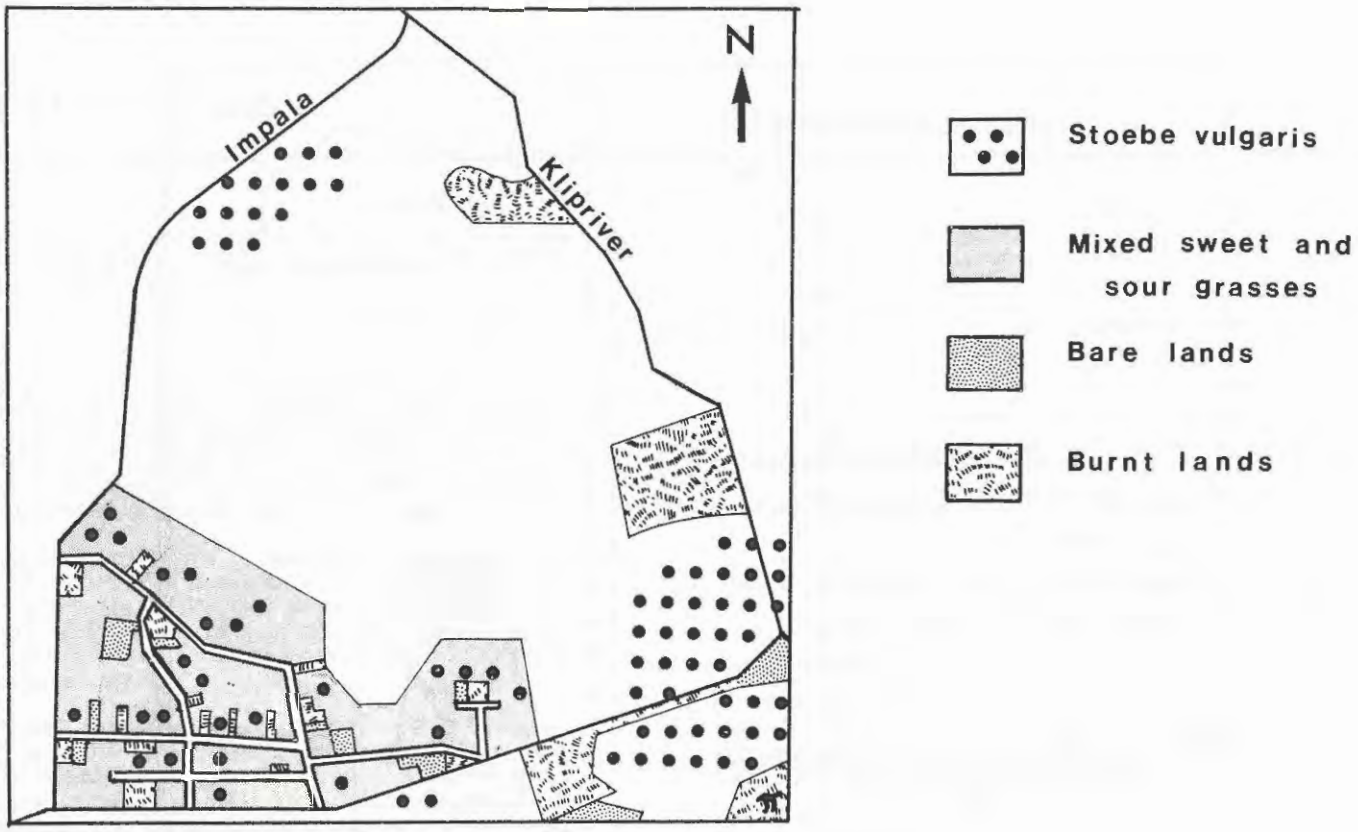

FIGURE 1 The Mondeor-Rispark area.

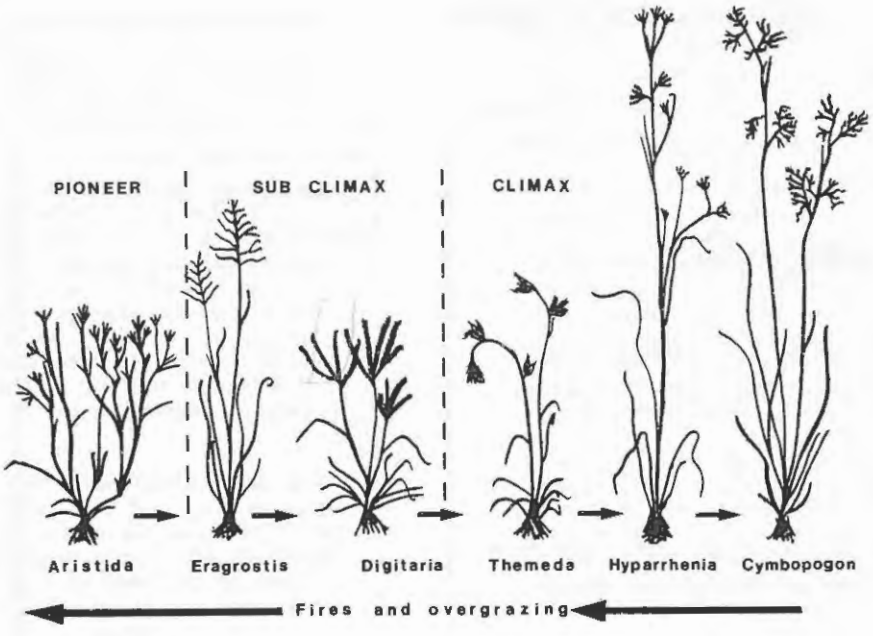

FIGURE 2 The relationship of plant succession to fires and overgrazing.

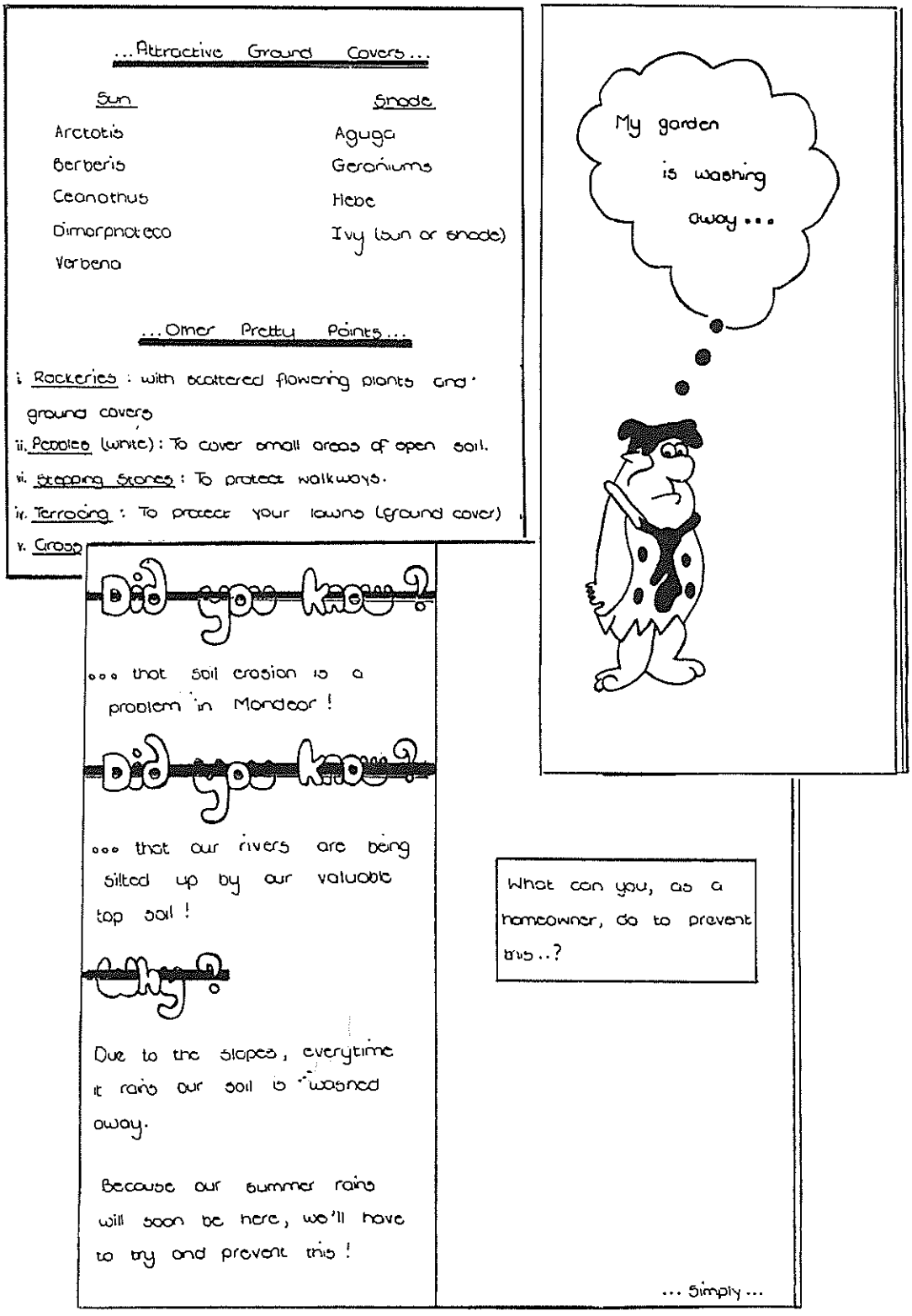

FIGURE 3 Extracts from the pamphlet designed for Mondeor residents.