Department of Primary Industries and Regional Development
GOVERNMENT OF WESTERN AUSTRALIA

Journal of the Department of Agriculture, Western Australia, Series 3

Volume 5
Number 2 *March- April,1956*

Article 13

3-1956

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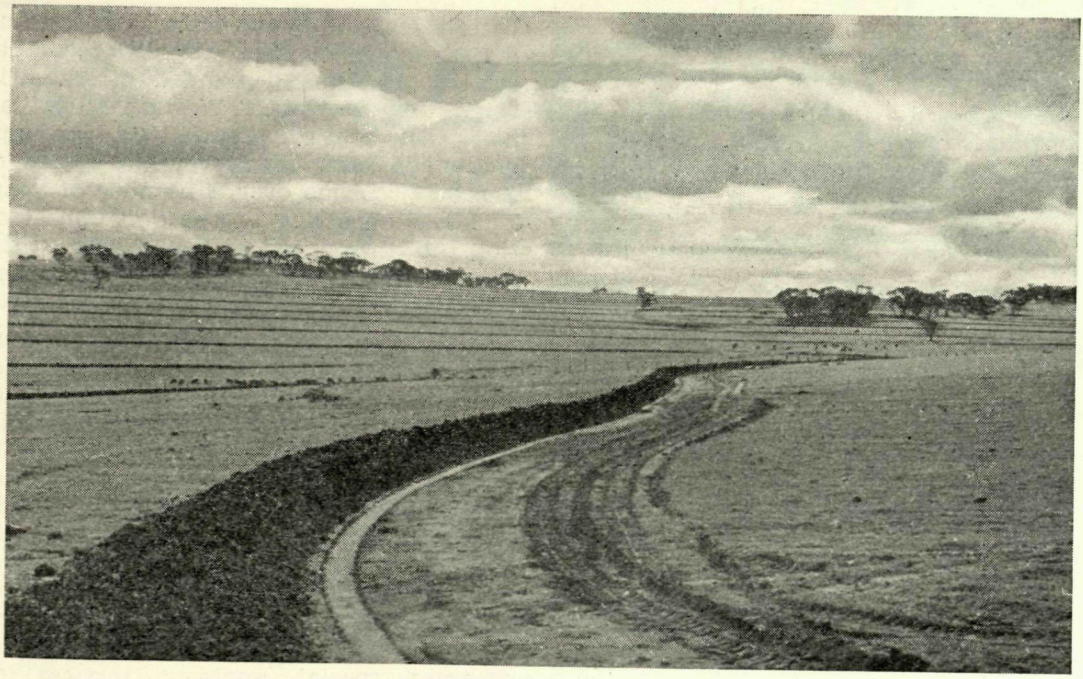


Fig. 1.—Contour banks are often needed to control erosion on sloping land. They break up a long slope into a number of short slopes so that when run-off does occur, the water runs downhill a short distance only before being carried slowly across the slope to a safe waterway. Soil fertility and plant cover must be maintained because earthworks alone are not enough to prevent erosion

SOIL CONSERVATION IN WESTERN AUSTRALIA, 1946-1956

By G. H. BURVILL, M.Ag.Sc., Commissioner of Soil Conservation

A LITTLE more than ten years ago, Parliament in Western Australia passed a Bill, for an Act Relating to the Conservation of Soil Resources and the Mitigation of Erosion. The Soil Conservation Act, as it is generally called, was assented to on January 9, 1946, and was proclaimed in July of the same year. We can now look back over the ten years since the Act was considered by Parliament. What were the reasons for this Act? What have been its effects? What is the future of soil conservation?

Soil conservation is now a common term. Twenty-five years ago it was seldom used even though many of its principles were well known at that time. These are the principles of good farming and wise land use. Soil conservation is best defined as "systems of land use which will keep soil in place, and will maintain or improve its fertility or productivity." The dictionary definition of the term "conservation" implies treating or handling things with an eye to their future usefulness. It may not strictly include "improvement," but soil conservation authorities throughout the world like to aim beyond the mere maintenance of soil fertility.

THE IMPORTANCE OF SOIL CARE

Throughout the world, the proper use and care of soils assumes greater and greater importance, to provide foods and fibres, as well as warmth and shelter for the rapidly increasing population. There is no large-scale alternative to soil for

Fig. 2.—Gully erosion caused by uncontrolled run-off of water from sloping lands is quite common on Western Australian farmlands, but fortunately is not severe in many places. It must be taken as a stern warning however

plant growth. The prime responsibility for soil care lies with farmers and pastoralists who own or use the land. They use it principally to make a living, but they should always consider its productivity over a long period, as well as immediate returns.

Soil can be conserved, but it can also be quite easily destroyed by faulty farming methods. It is only a thin outer layer of the earth's crust. The two main agents of soil destruction and removal are moving water and moving air, or wind. These two cause soil erosion if poor farming and grazing methods allow them. Soil erosion has become so widespread and common in the world that many countries now have Acts of Parliament and Government agencies with power to control faulty land use methods. These organisations' main work is, however, giving advice and assistance to farmers with erosion and conservation problems.

SOIL CONSERVATION IN AUSTRALIA

Here then we have the background for the Soil Conservation Act of 1945:—Growing concern in many countries about soil erosion; great publicity to the "dustbowl" conditions in United States in the mid 1930's; the development of the great United States Soil Conservation Service. Nearer home, evidence of soil erosion by water and wind becoming all too common on the State's farmlands. Other Australian States, New South Wales, Victoria and South Australia had already felt that erosion problems demanded attention in the State's interests. A Western Australian Soil Conservation Committee was appointed in 1936. Its survey and review of erosion problems over a number of years led to the drafting of the Soil Conservation Bill, introduced to Parliament by the Honourable F. J. S. Wise, who was then Premier of the State.

Departments of Agriculture in the Australian States have, for many years, devoted much effort to finding methods of maintaining and improving soil fertility, and have made advice freely available to farmers. But farmers, and communities generally, do not think seriously about soil conservation, until soil erosion becomes quite active. The attitudes and actions of farmers should be the most powerful force in achieving soil conservation and soil erosion control. Most governments now organise special advisory services on erosion problems. This may not be sufficient. The national importance of soil to the country's survival and wealth makes it necessary to have power to compel proper action by individuals, some of whom may be willing to stand by and watch land which they own, being gradually destroyed by erosion.

The Soil Conservation Act contains powers to deal with cases where persons will not act voluntarily to protect their lands. Such power is not often required, but must be available—in fact it has only been used once in the past ten years.

WEST AUSTRALIAN PROGRESS

The Soil Conservation Act provided for a Soil Conservation Service branch to be set up in the Department of Agriculture to deal with the special problems of soil erosion and soil conservation in the State. The branch was started in 1946 with Dr. L. J. H. Teakle as the first Commissioner of Soil Conservation. The time since then has been a difficult period for recruiting professional and technical staff, but with the men available, the Soil Conservation Service believes it has made good progress with its functions. The Commissioner and seven other University graduate officers, assisted by three technicians with Muresk

Agricultural College diplomas, are now available to deal with general soil erosion problems. Five other officers are engaged on soil research, mainly relating to the salt problem.

The very wet winters of 1945 and 1946 showed many farmers how soil erosion by water could occur, especially on cereal growing areas. There was plenty of earlier erosion, too. But from the outset, the Service has never been content to try only to heal erosion wounds. It has emphasised the need to give thought to all aspects of land use on a farm, so that effective and complete soil conservation might be achieved. Work on individual farms has been mainly, but not entirely, in the 15 to 25-inch rainfall belt, where the climate, topography, soils and extensive cropping with cereals, combine to give the greatest erosion hazards. Seven hundred and fifty farmers have been advised on specific erosion problems on their farms. Two hundred and forty have constructed earthworks for erosion control or to control water movement. Contour working, with all cultivation on the level, has been applied on 18,000 acres. A further 20,000 acres has been protected by contour banks of earth. Seven hundred acres of pasture land has been treated with contour pasture furrows. In orchards and vineyards contour practices are in use on 165 acres.

These figures may sound small when we consider the millions of acres of farmlands and the thousands of farmers in the State. They *are* small, but they represent the specific records known to the Soil Conservation Service of definite attention to erosion problems. The need for soil conservation has been brought before hundreds of other farmers by field days, farmers' schools, radio broadcasts, leaflets and articles. Self help is encouraged. Complete farm planning for soil conservation is a new development in which a number of farmers is showing keen interest. District organisations like Pasture Improvement Groups, Junior Farmers and Road Boards are showing greater interest in soil conservation in several areas.

Fig. 3.—Cereal rye is a useful crop on sand drift and wind-eroded areas. Here a fence has been half buried by soil drift

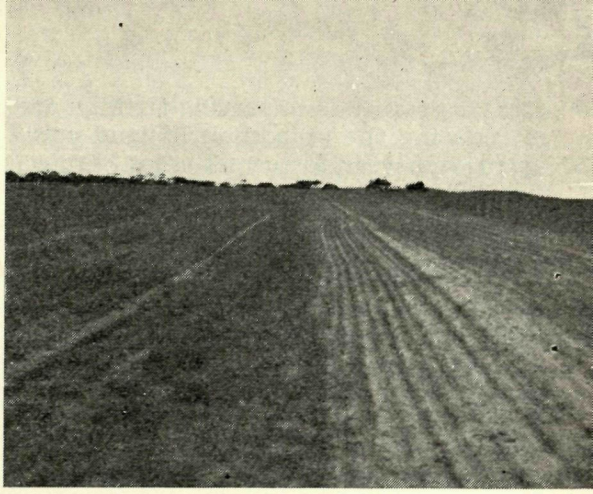


Fig. 4.—Subterranean clover is helping to improve soil fertility in Western Australia. This photograph shows light land at Wongan Hills sown to clover 1941, except the light coloured strip. The clover was ploughed and seeded to wheat in autumn 1947, and yielded better than 30 bushels an acre. In 1948 wheat was again seeded. Note better crop and darker soil where five years of clover pasture has added organic matter to the soil. Photo taken on June 23, 1948

When the Soil Conservation Service commenced field operations early in 1947, two successive wet winters had caused much erosion and demands for help were numerous. Methods of attack were adapted from those successfully used in other States. In the past eight years heavy rains have tested many jobs involving earthworks, and in general they have been entirely effective. Even five to ten inches of rain in three days in February, 1955, did little damage on protected areas. Untreated lands were damaged in many districts.

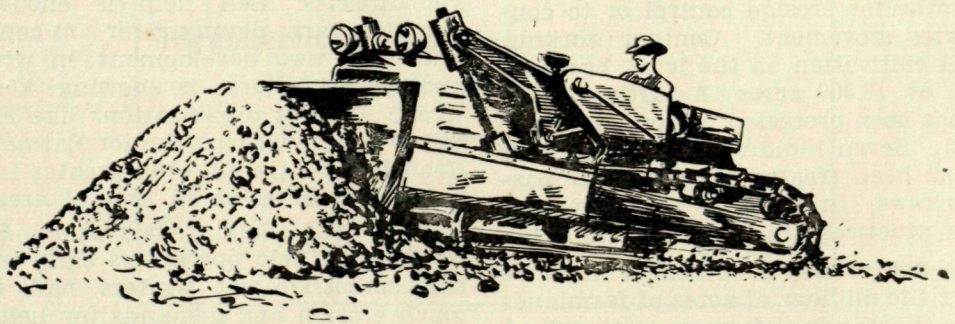
LOOKING AHEAD

What of the future? Soil conservation on farms in Western Australia is in a fairly sound position, but there are thousands of farm paddocks where evidence of water and wind erosion indicates the need for more protective measures. Improved pastures of subterranean clover, barrel clover, lupins and Wimmera ryegrass are giving

great assistance in improving fertility, and in reducing the proportion of land cultivated each year for cereal crops. Protective cover of living or dead vegetation on the soil surface is the result of more well-managed pasture, less bare fallowed land, and fewer rabbits.

The application of complete soil conservation measures on our farmlands and pastoral areas cannot, at this stage, be rapidly achieved. Many landholders are still not familiar with the more general conservation ideas. Most of those who are, still require much detailed, on the spot, advice about their application. Soil conservation advisory work can go only so far through lectures, leaflets and other forms of the spoken or written word. It is a "farm to farm" job—even a "paddock by paddock" job. It needs trained advisers and technicians who have a sound general knowledge of farming and grazing practices suitable for an area, as well as how to apply special erosion control methods. Our experience so far is that each officer, once he and his work become known, creates a demand for more work than he can reasonably handle. The Soil Conservation Service has always had an unsatisfied demand for advice and visits, some of which have had to be deferred for long periods. I believe efforts should be made to build up the staff till 20 or 25 advisers are available to help farmers with their soil conservation problems, and to carry out the functions and obligations which are set out in the Soil Conservation Act, 1945, and the recent Soil Conservation Act Amendment Act of 1955.

The attitudes and actions of farmers and pastoralists in using their land, will, in the future mainly determine how effective are our soil conservation and erosion control efforts. The general public should encourage them in every way, and support public services which aim to conserve vital natural resources.



RABBIT CONTROL

Outbreaks of myxomatosis continue to be reported from widely-separated areas and some very active spreads have occurred in areas which have not been "seeded" with infected rabbits for 18 months or more.

This suggests that the disease could "smoulder" for long periods and spread rapidly when conditions favoured an increase in the number of vectors such as mosquitoes, stickfast fleas and other insects.

Areas investigated by A.P.B. officers during January-February included Bridgetown, Manjimup, Cranbrook, Albany, Gnowangerup, Lake Grace, Pingrup, Kulin, Kondinin, Hyden and Bruce Rock. Spreads of varying intensity had been reported from all these districts.

At Darkan and Mt. Barker, myxomatosis outbreaks have completely disorganised the "1080" poisoning programmes.

Farmers are urged to take full advantage of the reduction in rabbit numbers by ripping warrens and fumigating to destroy survivors. It was known that a percentage of the rabbits survived the disease and these could build up a resistant strain which would be immune from further outbreaks.

Every effort should be made to wipe out the few remaining rabbits to guard against re-infestation.