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CLOVER PASTURE AT WYALKATCHEM

There is very little chance of run-off or soil damage when the topsoil is protected by a clover pasture like this. The clover also builds up the fertility and structure of the soil, making it more absorbent and resistant to erosion damage. This pasture is on the property of Messrs. G. T. and L. G. Carter. The clover was sown in 1957, left pasture in 1958 and the paddock cropped in 1959. The photo shows the recovery of the clover pasture by September, 1960.

MANAGE YOUR RAINFALL FOR MAXIMUM PRODUCTION

By J. E. WATSON, B.Sc., Adviser, Soil Conservation Service

HOW much would an extra inch of rainfall be worth to you? Much sloping land loses this much and more by run-off every year. The soil is the main asset of your farm, but your profits depend on how you manage the rain which falls on it.

WHAT HAPPENS TO YOUR RAINFALL?

1. Do you let much of the early winter rains run off to the rivers? This is valuable water which should be used for early feed growth, or to wet the soil for early cultivation of land to be cropped.

2. Do you let water running off your property carry with it plant nutrients and topsoil which will silt up culverts, creeks, rivers and harbours?

3. Do you, on the higher slopes have insufficient rainfall for growing certain plants (e.g. sub-clover), whilst your neighbours lower down are complaining of flooding problems and a rising salt water table?

4. Do you, even within your own property, have higher slopes which are too dry, while lower slopes and flats are too wet?

5. Do you let millions of gallons run off your property during the winter and have a water shortage in summer?
SEVERE GULLYING IN THE EASTERN WHEATBELT

Even in the drier parts of the wheatbelt there are many examples of severe gully erosion. These gullies are caused by excess run-off from sloping lands. Once formed the gullies act as collecting drains which allow valuable rainfall to be quickly lost in addition to the soil which is washed out. With a system of contour banks the gullies can be reclaimed and run-off reduced and controlled.

TO REDUCE RUN-OFF

As much rain as possible should soak in where it falls and be used there for increased production from better pastures and crops. Here's how to encourage this:

(1) **Keep a cover of vegetative matter on the soil for as much of the rotation as possible.** Rain drops hitting bare soil will dislodge fine particles. As the muddy water soaks in, these particles will block the pore spaces in the surface soil and reduce the rate of absorption. Grass cover will prevent this. Grass will also impede the downhill movement of the water, giving it more time to soak in. Dry grass left on the surface at the end of summer will allow rapid penetration of the first winter rains. The grass protects the surface soil from the drying action of the wind and sun; moisture loss from evaporation is reduced. Pastures will germinate early, and have a better chance of survival if a dry spell follows the opening rains.

(2) **Encourage and maintain good soil structure.** Topsoil with good structure will allow rain to soak through quickly and yet hold a maximum amount for later use by the plants. It will not get

CONTOURING SAVES RAINFALL AT DOODLARINE

This sloping land was cropped on the contour by Mr. G. W. Henderson. After a heavy rain each combine furrow was left holding water which had accumulated because the rain fell faster than it could soak into the soil. As the furrows were level (i.e., on the contour) the water was held in them to soak in after the rain stopped. If these furrows had been leading downhill all this water would have been on the move—to be lost from the slope and possibly washing gullies and flooding lower land.
waterlogged easily. A long period of pasture (clovers and grasses) between crops will improve the soil. Too much cultivation and cropping will damage the soil structure.

(3) **Cultivate on the contour to ensure that most of the furrows will be level.** When rain falls faster than it can soak in, the water collects in the bottom of the furrows. If the furrows lead downhill, the water will start to flow. Level furrows will hold the excess water and allow it to soak in after the rain stops. If harrows are used behind the combine, the furrows will not hold much water. If you don't use harrows, the contour combine furrows will have maximum capacity. They will keep the water where it falls. The furrows will still have some holding capacity in the pasture years.

More rain soaking in (plus superphosphate) means better pastures which create better soil structure which allows more rain to soak in which means better pastures . . . and so on.

**TO PREVENT SOIL LOSS BY RUNNING WATER**

The fundamental principle is to reduce run-off by getting most of the rain to soak in where it falls, as suggested above. The second principle is to prevent water from concentrating and flowing in volume over cultivated soil. When cultivating don't touch the grass which grows where water flows. Leave natural flow lines uncultivated and protected by a dense grass cover.

Contour banks are used to intercept water flowing down the slope before it has sufficient volume and speed to erode the soil. The banks can be level and designed to hold and absorb all the water they

**CONTOUR BANKS AT BEVERLEY**

This photo shows a contour bank system in steep rocky country on the property of Mr. J. W. Woods. The contour banks intercept water running off the rocks and arable slopes. Previously the run-off had caused severe gullying on the lower slopes. The gullies have been filled and reclaimed and further loss of soil has been prevented by the protection of the contour banks. After absorbing as much rain as possible the banks discharge any surplus water into the well-grassed waterway in the centre of the picture. This waterway is never cultivated so that any downhill flow must take place on soil protected by a dense grass cover.
intercept, or they can have a small gradient to move the surplus water slowly across the slope. This surplus must be discharged on to a grassed area (preferably a natural flow line) where it can flow downhill without causing erosion damage.

**Banks** are necessary when hazards such as rock outcrops rapidly shed water on to arable ground.

**Banks** make it safe to reclaim eroded land, by preventing filled gullies from washing out again.

**Banks** should be used if there are a number of flow lines in a paddock (where water can still concentrate in spite of contour working) and it is impracticable to leave them all uncultivated. The safest flow line is selected as a waterway and contour banks divert the run-off water to it from all of the other depressions.

### STOCK WATER CONSERVATION

Improved absorption on the higher slopes can result in improved ground water supplies.

Contour banks can be used to divert run-off water from large areas to fill dams (earth tanks).

If you have stopped run-off from your farm lands, you can prepare special roaded catchments to fill the dams.

**Soil and water (rainfall) are the key resources of an agricultural country. Keep them on your farm and don’t let soil erosion rob you of your most valuable assets. Good pastures and contouring will help you do this.**

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### BOOK REVIEW

**THE PRINCIPLES OF DAIRY SCIENCE**

"The Principles of Dairy Science," by Vanstone and Dougall, is a welcome addition to the general section of literature on the dairying industry.

Literature for the dairying industry (together with all other industries) has become particular and precise with the onrush of technology, and it is pleasing to report that this book is of a broad enough canvas to cover—

1. Feeding and management (under U.K. conditions, but of interest to Australian producers).
2. Chemistry of milk constituents.
3. Manufacture of various products.
5. Some aspects of the law relating to the dairy industry.

It is an ideal book for students and others interested in dairying, up to about diploma standard. It is better than a lot of specialised books on the analytical material and diversity of tests for the purpose of the control laboratory, and contains much that is of general interest.

A useful appendix on British Standard Methods is included, the index is adequate and the table of contents well arranged.

—N. INGLETON.
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