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Darrel Brewin
John Collett

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Unique co-operative landcare venture in the Avon catchment

By Darrel Brewin, Leader, Landcare Taskforce, Department of Agriculture, Northam and John Collett, Manager, Alcoa Landcare Project

The Avon catchment is bustling with landcare activity generated by a unique co-operative venture between farmers, the Department of Agriculture, the National Soil Conservation Program and Alcoa of Australia Ltd.

The Avon Catchment Landcare Program was initiated by the Department of Agriculture and Alcoa, in support of the national Decade of Landcare. The program provides financial, human and technical resources to undertake catchment and farm planning and demonstrations of rehabilitation techniques that tackle soil and water degradation problems.

We know that without specially planned landcare programs and substantial changes in land management, land degradation will continue and further losses of agricultural production will follow.

The problem

Most land degradation problems in the Avon catchment are associated with inefficient use of rainfall, poor drainage or the way soils are managed.

It is estimated, for example, that induced or secondary soil salinity is presently affecting more than 440,000 ha of agricultural land in Western Australia. The Department of Agriculture estimates that this is increasing by 11,000 ha per year.

The four most salt-affected Shires in the Avon catchment share at least 50,000 ha of induced salinity. The damaging winds of Cyclone Fifi earlier this year demonstrated that nearly all the soils of the catchment are prone to wind erosion.

These problems and others can be prevented, and even reversed, with co-operative planning and adoption of more stable agricultural practices across entire catchments.

To achieve positive results, these practices must aim at water control, and soil protection and improvement. Water control can be achieved through greater water use efficiency by crops and pastures, strategic placement of trees and improved surface and shallow drainage.

Maintenance of adequate surface protection, conservation of remnant vegetation, minimizing soil disturbance from tillage and trafficking, and
strategic use of soil ameliorants (for example, lime or gypsum) are techniques for soil protection and improvement.

Catchment planning provides solutions

Farmers, as landholders, are very much aware that conservation does not stop at their farms' boundary fences. They are increasingly joining forces to tackle land problems co-operatively on a catchment basis.

Catchment planning involves neighbouring farmers co-operating together as community groups in small agricultural catchments. The group members work together with Department of Agriculture land conservation advisers in a range of planning activities, including workshops, field studies and mapping exercises.

These activities help farmers to understand the degradation processes of their area and to define the problems accurately. Farmers also improve their knowledge of soils; their limitations, hazards, management needs and agricultural potential. Farmers can then map their properties' soils and natural features, degradation problems and present farm layouts.

With this information farmers develop and document an overall plan that integrates the most appropriate management options for their local catchment.

The comprehensive plan provides individual farmers with information to guide their property planning in a way that is complementary to their neighbours.

Landcare in the Avon

The Avon Catchment Landcare Program, covering an area of 2.5 million hectares, extends from near the Perth metropolitan area in the west, east to the Shire of Trayning and from Goomalling to Brookton Shires to the north and south.
Within the program area there are 31 land conservation districts and 24 landcare groups, who use small local catchments as their geographic boundaries.

The Avon Catchment Landcare Program was established in January 1990. Its goal is to develop and extend efficient and sustainable farming systems.

The program involves:

- demonstrating that agriculture and land conservation are compatible objectives for sustainable farming;
- establishing a landcare team, supported by research and extension advisers, at the Department of Agriculture's Avon Districts Agriculture Centre at Northam;
- supporting the Alcoa Landcare Project;
- accelerating the development of six integrated agricultural catchment demonstrations;
- documenting examples of integrated catchment planning and management;
- helping a further 19 farmer catchment groups to plan their catchment management programs; and
- initiating a community-based integrated management plan for the Avon catchment.

Alcoa Landcare Project

In co-operation with the Department of Agriculture and community groups, Alcoa launched its own Landcare Project in October 1989. Part of this project supports the six farmer catchment groups in the Avon catchment to accelerate land reclamation techniques through the establishment of on-farm demonstrations.

By 1995, there will be a grid of six Landcare group demonstrations, which are representative of the farming systems of the district, across the Avon catchment. Each demonstration will show a range of landcare practices that will be examples for other farmers to adopt. The group management methods and catchment planning procedures will be documented and made available for use throughout the State's agricultural areas.

The Alcoa Landcare Project is acting as a catalyst by creating opportunities for the community to work together in land conservation. Alcoa has offered its financial and technical resources for seven landcare projects. These are:

- Establishing six farmer catchment demonstration sites in the Avon catchment.
- Supporting Western Australia's only major surviving freshwater lake in the wheatbelt at Lake Toolibin.
A rehabilitation project in the Beeliar Wetlands in the southwestern part of the Perth metropolitan area.

Helping the establishment of the Tammin Alcoa Landcare Education Centre.

Sponsoring school curriculum-based resource packages for primary and secondary schools.

Establishing landcare information picnic sites on the Avon River.

Supporting Greening Western Australia's community tree planting activities, particularly Ribbons of Green.

Selection of the Alcoa-sponsored catchments

The six sponsored catchment groups were selected on a set of criteria put together by the Department of Agriculture's Avon Districts Agriculture Centre and Alcoa. The selected catchments had to be established groups that could demonstrate actual attempts to solve the landcare problems in their catchment. The group members accepted their responsibility to the wider community and were confident of their abilities to meet the demands of the program. The spread of catchments was representative of the farming systems and degradation problems of the Avon catchment.

Demonstration sites established

The six sponsored catchment groups cover an area of more than 125,000 ha and involve more than 80 members. The groups are Morbinning (east of Beverley), Westdale (west of Beverley), South Yoting (east of Quairading), South Tammin (south-east of Tammin), Gabbyquoiquoi (north of Goomalling) and Yeelanna (north-west of Trayning).

Landcare Taskforce

The Avon Catchment Landcare Program is managed by a specially formed Taskforce of land conservation advisers. Five land conservation advisers including the Leader, Darrel Brewin, are based at the Avon Districts Agriculture Centre. One land conservation adviser is located at the Department's Merredin office.

The Taskforce and other advisers and research officers at Northam work closely with the catchment groups, helping farmers with catchment planning and advising on the establishment of land rehabilitation demonstrations.

Demonstration for control of wind erosion

One example of the demonstrations being developed by the catchment groups is in the 43,000 ha South Yoting catchment. This project involves planting tree belts to control wind erosion on sandplain soils. This is the first demonstration of its type in the central wheatbelt. The aim is to determine the best combination of windbreak shapes to reduce the velocity of the prevailing winds, and at the same time provide a favourable environment for plant growth and animal shelter.

Advisers expect the demonstration to produce similar results to those obtained in tree belt trials with pine trees at Esperance. As a result of these shelter belts, Albany research officer Ruhi Ferdowsian reported a 27 per cent increase in lupin production on the sheltered side of the windbreaks, a 5 per cent increase in lamb survival and a 31 per cent increase in wool production.

The demonstration on South Yoting farmer Peter Gmeiner's property consists of four 16 m wide tree belts, 250 m apart, running south-
west and north-east across the prevailing wind and approximately in line with the land contours.

Each of the four tree belts was planted with different tree species in different combinations based on expected final growth height and shape.

More than 3500 trees were planted; the first row with low-high-low growth trees, the next two with low-medium-high and high-medium-low trees and the last with a medium-high-medium belt.

Initial results of the demonstration are expected in about three years time, but realistically it could be up to eight years before any significant results are achieved.

**Monitoring for results**

The Taskforce and farmers are monitoring all the demonstrations. This includes before and after photography, installation of piezometers to measure groundwater change, and anemometers to determine the effect of windbreaks on wind speed. Crop growth will also be recorded between tree belts.

As well, the Taskforce is compiling comprehensive documentation on the formation and development of the catchment groups and the process of producing their catchment plans.

By the end of the five years of the Avon Catchment Landcare Program, an extensive practical and technical resource will be available on planning and combating land degradation in catchments. This resource can be used for all groups in the agricultural areas of Western Australia.

For more information on the Avon Catchment Landcare Program contact the Avon Districts Agriculture Centre, Northam on (096) 22 2122.