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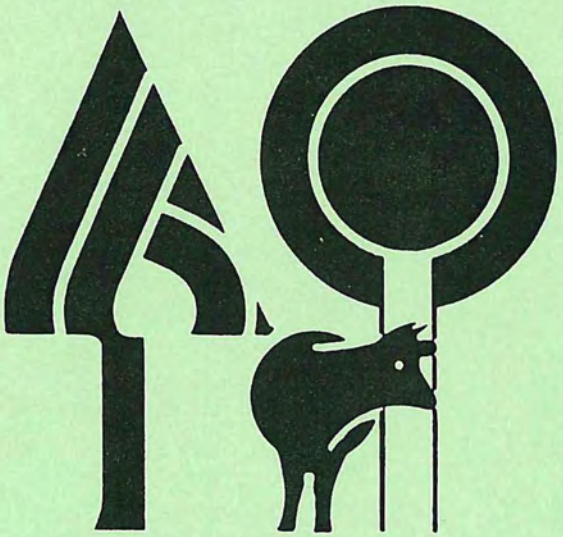
WESTERN AUSTRALIA

Agroforestry Update

Newsletter for Agroforestry

Researchers and Practitioners



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C.S.I.R.O

Western Australia

10

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Agroforestry Update: An occassional newsletter for agroforestry practitioners, research workers and extension specialists.

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Editors:

Richard Moore
Department of Conservation and Land Management
Busselton
Western Australia 6280
Telephone (097) 52-1677

David Bicknell
Department of Conservation and Land Management
Esperance
Western Australia 6450
Telephone (090) 71-3733

Geoff Anderson
CSIRO
Private Bag
PO Wembley
Western Australia 6014
Telephone (09) 387-0632

Typist:

Georgina Larsen
Department of Conservation and Land Management
Busselton
Western Australia 6280

Word Processing Centre
Department of Agriculture
Baron-Hay Court
South Perth 6151

Printer:

Kim James
Publications
Department of Agriculture
Baron-Hay Court
South Perth 6151

Contents

EDITORIAL

Our mailing list is growing steadily so its worth reminding readers of what we mean by "agroforestry". A broad definition is generally accepted. That is, that "agroforestry is the management of land for increased net social benefit by the simultaneous production of farm and forest products." "Simultaneous production" is interpreted as production from one management unit (the unit could be as large as a farm or even a catchment). "Forest products" include direct products such as timber and indirect benefits such as shelter and lowering of water-tables. In other words, agroforestry is the deliberate integration of trees and farming and can take many forms (see articles in this issue; "CSIRO's Regreening Australia" and "Draft Strategy Plan for Agroforestry").

Thanks to all those who have contributed to this issue. We are always grateful for contributions. Somehow it seems easier to obtain articles from people closer to home, so if you want to redress the Western Australian bias, of the last few issues, we'd be pleased if you can help.

GOVERNMENT STATEMENT ON THE ENVIRONMENT PRIME MINISTER JULY 1989

by Michael Hall
National President
Australian Forest Development Institute

Editors note: Reprinted from" Australian Forest Grower," Spring 1989

Main Points:

A Decade of Land Care was announced together with $320 million to (a) increase tree numbers by 1 billion by the year 2000 which includes planting 400 million seedling trees and 600 million from direct seeding and (b) to conserve remnant vegetation ($2.5 million over 2 years). Funds will largely be channelled through self-help farm groups.

Taxation arrangements for the prevention and treatment of soil degradation will be undertaken immediately to objectively develop and set targets.

$6 million will fund Land Care groups and co-ordinators and the preparation of regional plans, advice to landholders, training and technical bulletins. Teaching at schools will be included. It would seem that Greening Australia and the National Tree Programme would be used in this operation together with the initiatives coming from the National Farmers Federation and the Australian Conservation Foundation in promoting farmer groups.

The Murray-Darling Basin Commission will receive an additional $8 million over 2 years to implement a National Resources Management strategy. The main objective is to improve water quality mainly by revegetation of recharge areas.

A new organisation will be formed - National Resources Research and Development Corporation - to examine soil, water and forestry issues and promote an integrated approach to land and water research. This was announced in May 1989 by Hon John Kerin and Senator Cook.

As a result of the listing on the World Heritage of the Lemonthyme and Southern Forests in 1988, $30 million over 5 years was promised for plantation and afforestation developments in Tasmania. This still holds in addition to the July 1989 Federal government initiatives.

Comment

The Federal and State Government have been active in promoting tree planting in rural areas over the last 10 years and a number of organisations have developed to enable this to proceed. Small regional groupings of farmers are encouraged to attack the problems of land degradation. There are now 200 such groups and with even more assistance from Governments, highlighted by this Statement, this number of regional groups is expected to rise from 200 to 1000 by the end of the Decade.

The actual organisation of this accelerated planting is to be at grass roots using the State Extension Services which are variously organised State by State with the combined resources of the National Tree Program and Greening Australia under the Department of Arts, Sport, the Environmental, Tourism and Territories. (Minister Senator Graham Richardson).

The setting of priorities will probably be made by a new and as yet unformed body called the National Resources Research and Development Corporation which has responsibilities for water, soil and forests of Australia. Strategy would come from the National Soil Conservation Program and detail administered by a Land Care Liaison Group made up of C.S.I.R.O., Dep. Primary Industry and Energy, and Dep. Arts, Sport, the Environment, etc. The mechanisms seem unclear at this stage when talking to Department officers.

The extent of this program is large in comparison to our past performance. The planting of 400 million trees over 10 years requires an annual average target of 40 million trees which are sufficient to plant 40,000 ha. That in turn is about half the total areas planted over the last 30 years by both State forest services and companies for wood production! The new fencing required in this decade will be enormous as much of this planting and seeding which could be a further 30,000 hectares per year will be in linear shelter belts. I do not believe that the effort required has sunk in yet.

One billion is a nice round figure!

While commending the Government for floating the program, there should have been debate within the Statement on the eventual use of these trees. Surely such trees form a basis for future energy, wood products etc. which can be harvested on a sustainable basis from thinnings and shelterwood systems while still retaining the cover and protection permanently? Harvesting would enable the trees to be eventually rolled-over and renewed and the program to be self funding.

The veritable "Magic Puddin'"!

CSIRO'S REGREENING AUSTRALIA
Gaps in Science
- and can we afford to be just green

by Wilf Crane
(Division of Forestry and Forest Products)

Editor's note: Reprinted from "Co-Research" - July 1989

'Tree loss has been at the core of almost every aspect of land degradation in Australia. Tree replacement will be essential if we are to redevelop the fertility of many of our degraded soils and maintain sustainable systems of agriculture'.

My own words, re-quoted from Richard Eckersley's Occasional Paper No. 3, "Regreening Australia" and originally contained in the summary of "Trees: their key role in rural and land management," a submission by the Institute of Foresters of Australia to the House of Representatives Committee of Enquiry into Land Degradation in Australia, March 1989.

Understanding this role of trees, and particularly the relationship between trees and soil, is obviously the key to the success of a program to reverse land degradation (and some of our problems of society) based on regreening Australia. However, Richard has concluded on the basis of the best data and advice available to him that the relationship of trees and soil 'remains clouded in controversy and touched with mysticism. Our understanding of the basic process involved in the interaction between trees and soil and groundwater is still limited'.

Although the controversies are not detailed in Richard's paper, I am aware by involvement of some of the main issues.

One fundamental question is: how important are trees in the formation of soil and sustained fertility? I maintain that deep rooted perennials - trees in particular, are, on many Australian parent materials, an essential agency of soil formation - especially in the duplex profiled soils. This implies that we may owe the thin mantle of fertile loam - the basis of our agricultural existence in Australia - to trees. Trees which produce fulvic acids, and which are characterised by deep rooted cycling are associated with ' podsolisation'; that process which, by discovery, founded modern soil science in Russia and which is the fundamental process whereby a fertile loam can be developed apart from and in association with an underlying infertile clay, on what might be described in Australia as parent materials similar to toxic mine spoils. In the foresters' submission, this relationship of trees and soils is developed as being fundamental to all other roles of trees - including the fixation of atmospheric carbon and nitrogen into the soil and the relationship of tree management with the major soil degradations of erosion, salting and acidity.

What a remarkable situation in Australian science. In the face of so many previous warnings, such as E A Southwell's classical collection in 1950 of essays on 'Food, Soil and Civilisation', we have arrived at his predicted point of crisis, with a scientifically elite society in charge of the world's most fragile ecosystems, but without the basic data or scientific consensus on which our future will be based. On face value, the $100 million regreening program and environmental strategy for the future of our land, to be announced on 20 July by the Prime Minister, may be based more on faith than on hard analytical science.

Thus one major contribution of Richard's paper is the identification of this gap. What is the relationship of trees and soils - are trees the answer?

The technological questions are just as important. What is the best stable land use for Australia? What agroforest combinations of tree, grass, beast and soil process are optimal? Might we be wasting $100 million in a vain attempt to replace native trees into the lethal environment which was the demise of the parent trees, i.e. rural dieback?

Two critical strategic questions arising from the paper are:

a. can Australia afford to be just green? The primary justification for the program of reforestation is environmental. The strategy does detail the fact that it will also have 'significant economic effects', but this is not a primary or equal-primary aim. The economics are listed more in terms of sustaining (our present?) agricultural productivity and an export industry in management skills and tourism.

Should we not be farming as much as greening, like the New Zealanders, with wide-spaced sylvicultures of commercially useful tree crops in agroforest combination with grazing? I could not find the commercial word 'agroforestry' in the paper. But agroforestry is the new, internationally accepted system and word for an analogue mimic of nature's 'savannah woodland'.

In structure, savannah woodland (agroforest) is the environmentally stable system (usually including a duplex-profiled soil) which has been tested, by nature, over evolutionary time on much of arable Australia. 'Agroforestry' is specifically listed as one of the three major forestry/environmental pressures the Government recognises, as outlined in the recent 'Research Innovation and Competitiveness statement by Mssrs Kerin and Cook. And agroforestry in theory, equally transcends the two separate corporations which Kerin and Cook have announced will administer forestry research in future: the Natural Resources R&D Corp and the Forest Industries R&D Corp.

But wide spaced sylviculture and agroforestry is also almost untested in Australia and the question again arises - might we see money misspent, not only in single purpose strategy but also due to a dearth of technology.

b. should a strategy of Regreening Australia be solely Government (and direct grant) based, and perhaps Government backed and led? An alternative is to place major emphasis on the landholders of Australia. This is much more a question of multiple or single purpose as above. Nonetheless, as Richard makes plain, the problem is one for every Australian now and in the future. In the words of Sir Ninian Stephen when launching the Australian Sylvaspade (tree planting spade) in the Bicentennial year:

'If we, the custodians of this land in 1988, are to leave it to future generations as a land worth living in, 'sylviculture' (the growing and tending of trees) must become a work familiar to us all'.

What is the essence of CSIRO's Occasional Paper No.3? Certainly a faith in trees, now endorsed by CSIRO. We have become latter-day St Barbe Bakers (founder of the 'Men of the Trees' society) - the concept should appeal to a wide range of faithful. But as Richard Eckersley says (CoResearch 324), the paper does not pretend to be merely an objective statement of facts, although there are plenty of facts therein, rather a propaganda document aimed to set out the strongest possible case for large scale reforestation.

This is an unusual role for CSIRO. The gravity of the threat to our future as a society would appear to warrant the action. But we should not forget that St Barbe Baker misspent money with green visions which were not sufficiently backed with science or technology. My mother was one of his 'men'! And although he contributed enormously - as no doubt will CSIRO's paper - to the cause of trees, some of his major schemes such as regreening the Sahara failed.

I believe a major value of the paper - in addition to the political force it immediately carries, is its value in pointing out the enigma and dearth of the science of soils and trees.

As we regreen Australia on the basis of faith and principle, let us back the effort with a major effort to de-mystify both the science and the technology of combining trees, soil and profitable, stable agriculture in Australia. Few scientists could disagree with Richard: 'CSIRO should be uniquely placed to present convincing arguments for change - backed up with solid scientific data'.

THE GREENING OF A BRIDGETOWN FARM

Editors note: We thank "The Countryman" and reporter Cheryl Rogers for this article which was published on 16 February 1989.

Trees are growing back into the landscape on a Bridgetown farm as part of the owners' long-term plan to diversify from fat lamb production into plantation and agroforestry.

Dianne and David Jenkins accept that they are pioneers in a field where there is no promise of a quick return.

With confidence in the economic future of farm trees and a genuine liking for seeing them grow however, they began 10 years ago to experiment with species selected to improve their farm, and provide a long-term income on the 230 ha property west of Bridgetown.

It was in 1983, however, that their plan to test the success of Eucalypts as part of a plantation and in agroforestry began to take shape. A five hectare plantation of Tasmanian blue gum (Eucalyptus globulus) went in for chipwood that year, and four years later they converted 26 ha of cleared paddock into a mixed Tasmanian and Sydney blue gum (E. saligna) agroforestry area.

David is president of the recently formed tree farmer sub-branch of the Australian Forest Development Institute (WA), which is keen to encourage more farmers to diversify into trees.

At a recent AFDI seminar he provided a guideline for those considering putting trees back into the landscape when he described the costs incurred under the two approaches he and Dianne have adopted so far at Bridgetown.

In the plantation area, globulus seedlings have gone in two metres apart in rows four metres apart to give a planting density of 1250 trees/ha.

The cleared paddock was first ripped to a depth of 60cm and the rip lines sprayed with Vorox (at six litres/ha) and Gesaprim (two litres/ha) after the break of season. Two weeks after planting, each tree received 100g of Agras No. 1.

David estimated the cost of establishing globulus in the plantation area at $526 ha, or 42c/tree based on 1987 costs. This included a $271/ha cost for materials - $212 for the trees, $15 for sprays and $44 for fertiliser.

Additional costs associated with planting into the cleared paddock added up to an estimated $255/ha - to cover ripping, spraying, fertiliser application and hand planting.

In the agroforestry areas planted in 1987, globulus and saligna are growing two metres apart in blocks of three rows. There is a four metre gap between each row, and 25 metres between each block of three rows.
Trees occupy seven hectares of the 26 ha agroforestry area and are planted at a density of 450 trees/ha - 300 globulus for every 150 saligna.

150 saligna. David estimated the cost of establishing trees on the agroforestry site at $190/ha.

"We plan to thin the globulus out completely at around year 10, along with 50 stems/ha of saligna. This will leave around 100 stems/ha of saligna to be grown on as sawlogs", he said.

"One of the main reasons we were attracted to agroforestry was that it offers the chance to use the land for cropping and grazing while you are waiting for a return from the timber.

"For the past three years we have cropped the 19ha between the trees with oats and vetch for hay, for an annual return of around $625/ha.

"We normally run about five ewes to the hectare here, and have been grazing at almost that rate from this summer. The trees have done so well on the site that they are now up to three metres tall. By the time they really start to affect pasture growth, we should be starting to get some income from the timber.

"Although the stocking rate will be reduced by shading in future years, we think this will be compensated to some extent by a reduction in the amount of run-off, soil conservation benefits, and the advantages of having shade and shelter for the stock.

"Another advantage we noticed with agroforestry is that it appears to diminish the effect of drought on trees. In 1986/87 our rainfall was only 21 inches, so was about one third down on the average. Trees in the plantation area suffered considerably, but those in the agroforestry area continued to do well.

"And although the 1988 rainfall was 35 inches, we observed less run-off from the area between the trees than there was in the drier year when we first planted the crop.

Trees in their first year were found to be vulnerable to attack by spring beetle, which in 1984 had destroyed about one third of the globulus planted in 1983.

The Jenkins therefore make every effort to have young trees in the ground well before mid-year, to give them time to establish before the pest becomes active.

They plan to continue with year in year out tree planting, keeping note of seasonal details as well as tree performance, and the cost and returns associated with each method they try. They hope this will help them to build up a picture of the species likely to do best in their area.

"If we can get the encouragement to plant, we will probably end up doing the whole farm. When we put the first plantation in for chipwood in 1983 we were told we could expect to get $10/cu metre from it, and it is disappointing that the price is still the same.

"However, it seems that the time taken for a return may be less than first thought. By planting year in year out therefore, there is only that initial eight to 10 year wait.

Agroforestry looks promising, and we will be continuing with both agroforestry and plantations. In the plantation areas however we will only be planting at around 1000 trees/ha, to guard against the affect of any future drought.

CENTRE FOR FARM PLANNING AND LAND MANAGEMENT (University of Melbourne)

The Centre for Farm Planning and Land Management was established in 1987, with funding from the Elisabeth Murdoch Trust, the Sidney Myer Foundation and the A.E. Rowden White Bequest. The objective of the Centre is to conduct and encourage research into the attitudes, policies and practices of land managers, communities and social structures in Australia, in order to identify and promote measures which could be implemented to achieve more sustainable land use and to provide a basis for interaction between those involved.

The Director of the Centre is Professor Adrian Egan, who is responsible to an Advisory Board. The Centre currently has a staff of four: Assistant Director, Andrew Campbell, a forester with expertise in farm planning, land management and extension; Dr. Lea Jellinek, Senior Research Fellow in Sociology; Research Fellow, Dr. Ranil Sananayake, and ecologist; and Research Assistant, Janet Hoare.

The Centre is currently working on a number of projects including: (i) a definition of sustainable agriculture and development of methods of measuring relative sustainability; (ii) an overview of the basis for sustainable agriculture in Australia; (iii) an analysis of the information base and support structures applicable to the development of sustainable cropping systems; (iv) a study into the social, economic and environmental impact of the Victorian Government plantation
programme; (v) development of cost effective measures for protection of farm trees from browsing animals.

DPI INVESTIGATES AGROFORESTRY FOR QUEENSLAND

Interest in Agroforestry is increasing

Agroforestry holds considerable promise for the future development of resilient and sustainable rural land management systems. In its broadest sense, agroforestry covers not only the combined land uses of wood production and grazing on the same land, but also agricultural, pastoral and woodland land uses as separate but complementary entities on a single farm or property.

In view of the rising interest in the potential of agroforestry expressed by rural industry representatives, landholders, scientists and professionals, Mr Gerry Shea of the Queensland Forest Service has been seconded to co-ordinate agroforestry within the new Department of Primary Industries. The initial term will be for six months, after which the position will be reviewed.

Scope of Agroforestry

The scope of agroforestry to be investigated will include the following aspects of trees on farms:

- woodland management on rural properties
- economics of woodlot forestry including pasture and wood production regimes on the same area;
- land care - role of trees in the restoration of degraded land or cleared land unsuited to sustainable agricultural or pastoral production;
- wind breaks, and
- trees for fodder, shade and amenity.

Fodder and shade trees have excellent prospects for improving farm productivity and resilience against drought, and this issue will be investigated thoroughly.

Traditional horticultural tree crops will not be regarded as falling within the agroforestry ambit.

Developing an Agroforestry Strategy

During the next six months, Gerry will compare agroforestry activity in Queensland with work being done elsewhere in Australia, and will develop a strategy for future action in the following areas:

Policy and Organisation	-	interfacing with formal structures within the new Department of Primary Industries, other Government agencies and rural industry groups responsible for policy matters; and initiatives such as Land Care.
Research and Development	-	stressing the multidisciplinary approach
Training	-	including programs for Extension Officers and landholders

Extension Services	-	covering international (particularly in tropical systems) as well as state-wide extension
Monitoring	-	setting the procedures to determine the effectiveness of future agroforestry programs in Queensland
Future Funding	-	mainly for research and development, tapping state, rural industry and national sources.

Express your views on Agroforestry

Gerry Shea is very keen to know the views of everyone interested in agroforestry, including industry representatives, landholders, and staff of government departments and local authorities. He'd like to know your area of interest, and your views on future requirements and the direction that agroforestry in Queensland should take.

Indications of interest will allow Gerry to develop an informal network of participants in a future agroforestry program. Although the function performed by the participants will remain within the formal organisational structures to which they belong, it is hoped that such an informal network will encourage cooperation and facilitate a multidisciplinary approach.

To register your interest in agroforestry, please contact:
Mr G. M. Shea
Queensland Forest Service
GPO Box 944
Brisbane 4001
Telephone: (07) 234 0164
Fax: (07) 234 0304

While it may not be possible to conduct discussions with every officer individually, wherever practicable group discussions will be arranged at various centres throughout the state, if a sufficient number of people register their interest.

Institute of Foresters backs Agroforestry as part of Land Degradation Programs

by Richard Moore

During 1989 the Institute of Foresters of Australia prepared a submission for the House of Representatives Standing Committee on Environment, Recreation and the Arts on "the effectiveness of land degradation policies and programs". The report of the Standing Committee, dated November 1989, includes several recommendations from the Institute's submission. I quote from the Standing Committee's report (P. 110 & 111):

"It is the view of the Institute of Foresters of Australia that neither punitive nor encouraging legislation is likely to be successful in the attack on land degradation. Rather the answer lies, in large measure, in the acceptance of agroforestry systems by landholders, and strategies for surmounting barriers to its implementation. Communication, research, education and extension will be at the heart of these strategies.

While the Institute of Foresters recognises that attitudes to current land management have been changing slowly in Australia, it believes much more must be done to create a social environment within which the seriousness of the problem and the magnitude of the task can be addressed. The Institute recognises that the National Soil Conservation Program, the National Tree Program, the National Afforestation Program, Greening Australia, whole-farm planning and work of many landholders throughout the country, have begun to develop new directions in rural land management. However the Institute considered that new initiatives by governments and communities are now needed to build upon this base. The Institute of Foresters saw the most important needs being met by:

- projecting and evaluating the role of trees in land rehabilitation;
- researching tree-based land management systems; and
- educating a new generation of land managers.

There is a particular need for research into agroforestry but this is one of the areas identified by Professor Ferguson as at risk of being over looked because it was essentially multi-disciplinary in nature and out side of the normally single discipline funding channels.

The Committee sees merit in the Institute of Foresters of Australia's proposal and considers that agroforestry could have significant land degradation benefits in particular applications. This matter requires further investigation and much more widespread field testing but, as discussed in Chapter four, there are problems involved in funding agroforestry research. Therefore there needs to be more promotion of the concept and the Committee recommends that:

> the proposed reforestation working party as a priority task investigate and develop ways to promote agroforestry."

BRANCHES NOT NUTS FOR THIS "SQUIRREL"

by Terry Reilly
Department of Conservation and Land Management
Busselton - Western Australia

Agroforestry, the combination of agriculture and wide-spaced P. radiata, is being actively researched in the south west of Western Australia, by the Department of Conservation and Land Management (CALM). One requirement for growing P. radiata in this way, is that trees should be pruned to about 10m. This high pruning is required to increase both the amount of knot free wood in the tree and the amount of light reaching the pasture.

A machine for high pruning these wide-spaced P. radiata has been developed by Crendon Machinery of Donnybrook, Western Australia, in association with CALM. In 1982 a Crendon orchard machine, (trade name "Squirrel") designed for fruit picking and tree pruning, was hired by CALM and its potential for high pruning of pine was assessed. After consultation between Crendon Machinery and CALM, the modified "Squirrel", which was more suited to agroforestry operations, was built.

This self propelled machine is triangular, with an open ended frame which supports an elevating platform. It incorporates a higher ground clearance, increased traction, and higher platform elevation than the orchard machine. It is powered by a 16 HP Briggs and Stratton motor, and is operated by two foot pedals located on the operator's platform. This allows complete freedom of hands to safely operate the hydraulic pruning tools. The maximum height of the platform floor is 6m and the overall machine width is 3m. Crendon Machinery estimate the cost of the agroforestry "Squirrel" in 1985 at $11,000 including pruning equipment.

Time trials showed that pruning with this "Squirrel" is up to nine times as fast as with polesaws, while actual operating costs are only twice those of polesaws. For example, pruning between 2.5 and 5.0 m, up to 37 trees per hour can be pruned using the "Squirrel", compared to 5 with polesaws. Pruning between 5 m and 7.5 m cost 56c per tree using the "Squirrel" and $1.45 per tree using a polesaw. The higher the pruning height, the more cost efficient the "Squirrel" is, compared to the polesaw.

Trials with this "Squirrel" have showed that it could be modified to operate in steeper terrain and to allow more efficient pruning between 7.5m and 10m. A machine to meet these requirements has been built and is being field tested.

Editors note: Since this article was written in 1986, there have been several developments including;

(i) The new "Squirrel", with its higher platform and better traction has proved successful.
(ii) The manufacturers estimate that the agroforestry "Squirrel" would cost from $20,000 (basic model) to $30,000 (top of the range model) in 1990.
(iii) Diesel motors are being used on the later models

GREENING AUSTRALIA IN THE MURRAY-DARLING BASIN

Rob Youl

Murray-Darling Basin Field Officer
(located with Greening Australia, Vic.)

Greening Australia Ltd is a national body with branches in each state and the two territories. GA has been given responsibility for the Federal Government's One Billion Trees program; therefore it must:

- liaise with the entire Australian community
- make policies
- provide advice on treegrowing techniques
- initiate public eduction campaigns
- seek and co-ordinate sponsorship
- foster the formation of groups
- manage projects
- disburse fiance to community groups and to individuals according to GA priorities

The national board comprises state and territory representative and an officer from the Australian Nursery Industry Association. State boards are generally elected by their respective memberships, which are open to the public.

GA also maintains a Murray-Darling Basin Committee to intitate special activities in that region. The organization recognises the Basin's supreme importance to the Australian way of life and the fact that parts of the Basin are severely degraded.

Incidently the Murray-Darling Basin supports:

- one-quarter of Australia's beef cattle
- one-quarter of Australia's dairy cattle
- one-half of Australia's wool and lamb enterprises
- one-half of Australia's dryland crops
- three-quarters of Australia's irrigated lands

These agricultural activities are pursued on an area that is one-seventh of Australia. This is about the area of France and Spain combined.

The different state branches that cover MDB are:

- ACT - GA ACT is responsible for parts of the upper Murrumbidgee catchment and the southern tablelands of NSW. Its annual budget of $70,000 is spent on employing a project officer, grants to farmers and community groups and on special projects.

- NSW - Of the annual budget of $90,000, a major portion will go towards employing several regional organisers who will also assist the NSW Total Catchment Management Committees. The remaining funds will go to community projects, the Sydney Tree Centre and activities in schools. An estimated 70 percent of GA NSW's effort will be within the MDB.

- QLD - GA Queensland has a budget of $350,000 covering seed collection, assistance to LandCare groups, whole-farm planning, urban bushland, training, research, public education and grants to community bodies. About 15 percent of these activities will impinge on the MDB.

- SA - With a main budget of $300,000, GA SA has decided to support nine projects including fauna corridors, direct seeding, a tree advice centre, schools, activities, TAFE courses and LandCare groups. Most of these relate to the MDB and $100,000 will be available for general community projects.

- Victoria - This state's budget of $460,000 will support existing major treegrowing organisations and projects such as Treeline (the revegetation of defunct railway lines), the GA Green urban forestry program, the farm trees groups, Australian Trust for Conservation Volunteers, regional programs in Gippsland, the North-east and the Pyrenees, public education and the establishment of seedbanks. About 30 percent of the budget relates to the Murray-Darling Basin.

	Telephone	Fax
GA ACT	062 823 214	
GA NSW	02 550 0720	550 0576
GA QLD	07 229 9622	229 1631
GA SA	08 337 2646	336 3377
GA VIC	03 654 1800	654 5040

"HIGH WATER USE AGRICULTURAL SYSTEMS" NSCP FUNDED RESEARCH AND DEMONSTRATION PROJECT

by Phil Scott
Resource Management Division
Western Australian Department of Agriculture
South Perth

Dryland salinity is a major soil conservation and water resource problem throughout much of southern Australia. Development of vegetation strategies that reverse the impact of past agricultural practices has been recognised as a high priority for research. Major restoration programmes will be required on many existing and potential water resource catchments affected by salinity throughout southern Australia, and in particular in the south-west of Western Australia. The philosophy of Integrated Catchment Management is being adopted to resolve the conflict between land and water management in many parts of Australia. In this context Integrated Catchment Management will involve the integration of reforestation strategies and agriculturally based, recharge minimisation strategies to reduce the social and economic effects of rehabilitation programmes. A relatively high level of farmer participation and co-operation will be required if these programmes are to be successful.

In Western Australia, rehabilitation strategies to control stream salinity have concentrated on tree planations. A current review of this research (Schofield et al., 1989) has indicated that between 40% and 50% of the landscape needs to be reforested if significant reductions in water table levels are to be achieved within the first ten years of tree planting. Widespread implementation of such reforestation programmes would mean a major restructuring of the agricultural industry in the region. Minimising the economic, social and political consequences of such restructuring is essential if such programmes are to be implemented on anything other than the relatively small scale of the current Wellington Reservoir catchment programme. The most effective way to achieve this is to develop and demonstrate new agricultural management strategies which reduce groundwater recharge and therefore reduce the area necessary to be reforested.

Research in Western Australia aimed at reducing rates of groundwater recharge has centred on measuring evapotranspiration (Nulsen, 1984; Scott and Sudmeyer, 1986; Greenwood and Beresford, 1979; Greenwood et al., 1981; Greenwood et al., 1982; Greenwood et al., 1985; Nulsen and Baxter, undated). By assuming no run-off, one can estimate the amount of groundwater recharge by solving a simple moisture balance equation. In reality, because large falls of rain inevitably lead to run-off, different agricultural species may create different amounts of run-off and seasonal effects on plant growth, evapotranspiration measurements can only be a guide to the amount of groundwater recharge expected under different agricultural species. From the evapotranspiration research done in Western Australia, and the effects on water tables observed under reforestation (Schofield et al., 1989), it is now possible to 'design' a vegetation treatment for a catchment, specifically to lower water tables; thereby reducing saline discharge from a catchment.

This, however, needs to be researched and demonstrated in practical terms for farmers, farm planners and other involved people.

Economic analysis of agroforestry systems centre on wide-spaced pines have shown them to be more profitable than conventional grazing in the 500-700 mm/annum rainfall zone (Moore, 1989). Anderson (1989) showed overall productivity increases in wide spaced pines are now well defined and their practical application can be carried out with confidence. Recent work on wide spaced Eucalypts is showing promise and requires larger scale demonstration. Returns from chipwood sharefarming in the same areas are competitive with returns from conventional agriculture (Moore, 1989). The productivity of deep sands has been increased by planting the fodder shrub tagasaste at a site receiving 550 mm of annual rainfall in Western Australia (Oldham and Mattinson, 1989). The productivity of perennial pasture systems for the higher rainfall areas of the south-west of Western Australia is stimulating increased interest. Apart from profit margins, the reason these systems are receiving attention is because of their soil conservation, and particularly salinity control benefits. As previously mentioned, these proposed benefits have not been practically demonstrated. In asking farmers to help control land degradation, we must assist them to plan to achieve the best possible vegetation strategy to ameliorate salinity, while at least maintaining productivity. In this proposal, the elements of salinity control, productivity and farm planning are to be brought together on a visually impressive scale and measurements and observations of the impact of the treatment will be taken.

The area targeted by this project receives more than 500 mm annual rainfall and 1400-1800 mm annual pan evaporation in the South-West of Western Australia. Farmers in these areas are generally enthusiastic about tackling their salt problems, but require proof of the value and effect of various salinity control strategies, and advice that accounts for the range of salinity control options that could be beneficial on their farm. Schofield et al. (1989) reviews the range of vegetation strategies available to control stream salinity. He also points out that the impact of many of the suggested agricultural strategies of reducing ground-water recharge, have not been tested on a catchment scale nor has their impact upon water table levels been tested. Of the 'agricultural' options only wide-spaced agroforestry stands have been documented to reduce groundwater levels. Anecdot evidence exists in Western Australia for the perennial pasture species lucerne to have the same effect. There is obviously a need to involve farmers in experimental demonstrations of the effect of various vegetation strategies on the salinity problem and to research and document these effects. The way is then open for both public and private agricultural advisers to provide advice on integrated salinity control options for farmers.

This project will allow the demonstration of salinity control strategies on six small sub-catchments. These will be instrumented to allow experimental monitoring of water tables and salt affected areas and will provide necessary data on the effect on catchment hydrology of various treatments. It is expected that these results will have direct application to climatically similar areas in Australia, and that the principles of salinity control will have application to all areas in Australia suffering from dryland salinity caused by overclearing.

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"HEAL" - HAMILTON ENVIRONMENTAL AWARENESS AND LEARNING

Showing how to beat the doom and gloom of land degradation

by Andrew Campbell

This article describes a program of farmer and community education, based on the exceptional on-farm demonstrations in the region around Hamilton in western Victoria. The project is called Hamilton Environmental Awareness and Learning (HEAL). HEAL is establishing a resource centre in Hamilton to promote and facilitate on-farm learning experiences for schools, students, farmers, Landcare groups and other individuals and organisations interested in what is really the ultimate goal - sustainable land management.

If land degradation is be reversed, then awareness of the solutions is the most desperate need. It is important that the message is not theoretical, but practical - illustrating 'can-do' approaches to reversing land degradation while maintaining productivity. That is what HEAL is about.

What does HEAL do?

HEAL provides an opportunity for people interested in positive approaches to sustaining the rural environment, to come and visit and learn from the achievements of farmers and community groups in the Hamilton area, who have already done outstanding work on the ground - not ideas or theories, but things you can see for yourself.

What does Hamilton have to offer

The Potter Farmland Plan demonstration farms; an outstanding community project to save the last mainland colony of the Eastern Barred Bandicoot within the town boundary; some of the leading agroforestry and direct seeding research and demonstration sites in Australia; the largest collection of eucalypts growing in one place on earth; farmer pioneers of the farm tree movement in Australia; very active landcare groups. These are just some of the resources of the region.

Who runs HEAL and where?

The Coordinator of HEAL is Mrs Sue Marriott who has an intimate knowledge of the farm demonstrations and the educational resources of the region, and experience in organising and leading tour groups in the area.

Sue works from her farm near Branxholme (055) 786 223, and at the Hamilton Institute of Rural Learning, North Boundary Road Hamilton (055) 711 298.

How much does it cost?

The cost of tours depends on the number of people in your group and your requirements for meals, transport and technical advice. HEAL can do it all for you or merely act as a go between with the demonstration sites.

HEAL is subsidised by Greening Australia and other sponsors, so that fees paid by visitors are only used to pay for the time farmers and experts spend with groups. It is necessary to charge for the farmers' time, as some are spending so much time with groups that they have to employ extra labour during peak times to do the farm work that they would otherwise be doing themselves.

The fee structure is still flexible in the early stages of the project. HEAL will organise and run tours for any group, with or without transport, with or without meals, with or without expert guidance. Subsidised rates are available for school groups. Quotes can be obtained from the HEAL office. Documentation about the sites on the various itineraries is provided.

EUCALYPTS AND OTHER UNWANTED EXOTICS

David Bicknell

Department of Conservation and Land Management, Esperance, WA

There have been several surveys, and many observations that most Australians do not want large areas of exotic species impinging on the landscape.

Within the 'classical' agroforestry, this has meant that pine trees are not popular in some parts of the country, merely becuase they are not Australian. This form of chauvinism is becoming more localised, with the recent outcries against Tasmanian Bluegum monocultures in Western Australia being a good example.

Eucalypts, however, are not always the 'good guys'. Many overseas countries now have some concern over the exuberant growth and feeding habits of eucalypts in their exotic environment.

A report from The Guardian, June 22 1989, was titled "Greens and farmers fight the Eucalyptus tree". An accompanying photograph shows riot police on horses charging the protesting farmers - in Portugal.
As in Australia, the tree in question is not the primary problem; it is the land use that excludes primary producers from agricultural options that causes problems.

The use of any tree in agroforestry systems should be determined by its effectiveness in meeting the aims of the planting. If a local or Australian species does the job as well, it will generally be planted, in Australia. However, lets not get hung up on the idea that exotics have no place in the Australian landscape.

DRAFT STRATEGY PLAN FOR AGROFORESTRY
by Richard Moore

The National Agroforestry Working Group has prepared "A Draft Strategy Plan for Agroforestry" as part of the "Year and Decade of Land-care". The Plan is based on a report to the Standing Committee on Forestry and the Standing Committee on Agriculture in June 1989 (outlined in "Agroforestry Update" No. 9).

The summary of the "Draft Strategy Plan for Agroforestry" is set out below;

"Agroforestry has been recognised in this document as the deliberate integration of tree growing within normal farming practices and is seen as a vital element in land-care proposals in Australia.

There are several alternative approaches to agroforestry that might be employed by farmers including:-

1. widely-spaced trees for timber with pasture for grazing
2. shelterbelts managed for erosion control, shelter and timber
3. woodlots managed for timber production, plus control of salinity and loss of nutrients
4. revegetation of degraded areas, and
5. trees and shrubs for fodder and salinity control

A strategy plan has been developed which aims to place agroforestry high on the national agenda for land-care.

The essential elements of this plan are as follows:-

1. Agroforestry representation is required on State Steering Committees set up for the "Year and Decade of Land-care".

2. These representatives (1) to provide the agroforestry component to state action plans.

3. Members of NAWG and state agroforestry working groups to assist with publicity for the "Year and Decade of Land-care".

4. NAWG to review existing agroforestry research and demonstrations and to encourage new research and demonstrations where necessary.

5. State agroforestry working groups to translate the latest findings about agroforestry into practical information for advisors and farmers.

6. Information on agroforestry needs to be incorporated into whole-farm planning. Training of agroforestry advisers and farm planners in each others field is needed to improve integration of skills.

7. Examples of agroforestry need to be established to treat notable areas of land degradation and for use in extension and staff training.

8. A strengthening of advisory services is required to translate the soil conservation initiative into action on the ground.

9. NAWG and state agroforestry working groups to establish in-service courses on agroforestry.

10. Tertiary institutions to be encouraged to introduce agroforestry courses.

11. All states should establish inter-agency agroforestry groups to co-ordinate and monitor research and extension activities.

12. Much of this strategy plan can be carried out by NAWG through its members in each state. However, further resources are required to strengthen advisory services".

The Plan is being considered by the Standing Committees. The Standing Committee on Forestry has indicated their general support. In particular, the Committee is keen for a National Conference on Agroforestry to be held - preferably in 1991. The National Agroforestry Working Group has commenced planning a conference.

OPINION

K.F. Wells (Hobart)

Editors note: Reprinted from "Bark" No 196, Oct. 1989

It was reassuring to see the recognition given by the committee reviewing the Division of Forestry and Forest Products of the urgency for redressing land degradation in Australia. The draft Review Report (June 1989) intimated (p.91) the Division does have a role to play through research into alternative silvicultural systems which yield wood whilst at the same time rehabilitating degraded land. When employed in conjunction with agriculture, as it would be on the majority of lands, this amounts to agri-forestry. As Wilf Crane points out (Bark No. 188, July 1989), this is not getting the attention it deserves. I earnestly hope that, in the review of the Division's research on eucalypts which is to be carried out (Recommendation 3 of the Review), this type of forestry will get a guernsey.

National Landcare Facilitator

One of the most exciting and significant developments in soil conservation in Australia at the moment is the emergence of groups of landholders with a common interest in addressing land degradation and a willingness to co-operate in tackling their own problems. These groups, under the rapidly unfurling banner of 'Landcare', are able to tackle problems which cross farm boundaries, they can make more efficient and effective use of government assistance, they can stimulate the development and extension of information and new ideas, and they are often a catalyst for more direct community participation in land protection activities.

Recognising the potential of Landcare groups, the National Soil Conservation Program (NSCP) has increased emphasis on funding their development and activites. The Ministerial Soil Conservation Task Force, involving the National Farmers Federation, the Australian Conservation Foundation and the Commonwealth, has also emphasised the role of Landcare groups in its policy suggestions.

Mr Andrew Campbell has been engaged as a consultant by the National Soil Conservation Program in the role of National Landcare Facilitor. Andrew Campbell was formerly Assistant Director of the Centre for Farm Planning and Land Managementat the University of Melbourne, and prior to that, Project Manager of the Potter Farmland Plan demonstration project in western Victoria. He is a forester who is actively involved with his family farm, and has 'hands-on' and research experience in land management extension, particularly with farmer groups and farm planning.

The National Landcare Facilitator project, over a three year period commencing in August 1989, has these objectives:

- to collaborate with the states in developing performance indicators which can be used to monitor the performance and impact of Landcare groups in Australia
- to keep the Soil Conservation Advisory Committee (SCAC) and the Ministerial Task Force informed as to progress with Landcare, especially with regard to opportunities for SCAC support
- to investigate constraints to the effectiveness of Landcare groups, and in collaboration with the States, develop strategies for SCAC to consider to overcome these constraints
- to liaise with State Landcare co-ordinators and facilitators to promote the Landcare movement
- to design and, with SCAC's approval, implement a research project to evaluate and monitor Landcare, inorder to determine the impact of Landcare compared with other forms of soil conservation extension, and the factors which influence the achievements of groups
- to undertake other tasks as directed by SCAC from time to time

Andrew Campbell, as National Landcare Facilitator, is responsible to SCAC through the Chairman, Dr Geoff Evans. Andrew Campbell is not a representative of the Commonwealth, nor a member of SCAC. He is based in the Faculty of Agriculture and Forestry in the University of Melbourne, retaining an honorary position as a Research Associate with the Centre for Farm Planning and Land Management.

His address is;

Andrew Campbell, National Landcare Facilitator

Faculty of Agriculture and Forestry, University of Melbourne
Parkville 3052

Phone (03) 344 7172, or 344 5025 Facsimile (03) 344 5570

AGROFORESTRY COURSE AT UNIVERSITY OF MELBOURNE

A new subject, Agroforestry, will be offered in 1989. The subject deals with the use of trees on farms for providing shelter for stock, arresting soil degradation, rehabilitating saline areas, beautifying the landscape, conserving wildlife, as well as for providing fuel, fodder and timber products.

Agroforestry will be offered as a common elective to fourth year students in both Agricultural Science and Forest Science. In order for students from both disciplines to have a sufficiently comprehensive base on which to undertake the course in Agroforestry, the opportunity will also be provided via other elective subjects for students to receive some basic education in the alternate discipline. Agroforestry will also be offered as a linking subject in the Post Graduate Diploma of Agricultural Science and the Post Graduate Diploma of Forest Science. Research in Agroforestry is now well established within the Faculty, and it is likely that an increasing number of Masters and Ph.D. students will elect to undertake research in this area.

BOOKS OF INTEREST

David Bicknell
NSCP Landcare Officer
Department of Conservation and Land Management
ESPERANCE WA

Bush regeneration: Recovering Australian landscapes Robin A Buchanan. 1989. TAFE Student Learning Publications. 259 pages of high quality information, drawings and photgraphs showing how to regenerate Australian plant communities. Costs about $32.50.

Field guide to Eucalyptus: Volume 1 and 2 M I H Brooker and D A Kleinig. 1984 and 1990. Inkata Press, Australia.
Volume 1 covers South Eastern Australia, and volume 2 covers South Western and Southern Australia. These books are primarily for identification purposes. There is considerable detail on botanic features; bark, leaves, inflorescence, buds and fruits. However, there is little information on the tree form, height, soil type and tolerances.

Flora of Australia: Volume 19: Myrtaceae - Eucalyptus, Angophora Exec. Ed. A S George. 1988. Australian Government Publishing Service, Canberra.
An excellent species description reference book. Does not have the photographs that make Brooker and Kleinig's book of such value, but does have more information on form and soil types.

A field guide to Melaleucas I Holliday. 1989. Hamlyn Australia.
Covers about 140 Melaleuca species from all over Australia. Has quite good photographs and line drawings for identification. The information is as up-to-date as possible, given that a revision of the genus is in progress. Lacks information on soil types.