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BAAT

Bulletin of the NSW Association of Agriculture Teachers

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Inside BAAT

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CONTENTS

Executive and Table of Contents	1
Editorial	2
President's Report	3
Life Membership	6
Correspondence regarding new Syllabus	8
J. A. Sutherland Award	18
NSW Conference information	25
Land Degradation Fact Sheets	27
Penrith Show Information	33
Rice Information	37
Australian Plants Society	53
How to Establish Native Plants	55
Australian Nursery Statistics	57
Marketing Australian Nursery Product	68
Conference Registration Form	73

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Editorial

Welcome to another BAAT in these dry and chilly times. Apologies for the lateness of this issue.

Hopefully, there will be something of use in these pages. There is quite a lot of space dedicated to the potential loss of stage 4 outcomes from the new Agriculture Syllabus. This has been quite an important and potentially damaging issue which seems to have been resolved satisfactorily, due in no small part, to the actions of our President.

A program for the next Biennial Conference is included. There is a great range of interesting activities on offer, including some welcome assistance with the still new HSC Ag and VET courses. Don't miss this one! The Registration Form is found in the back of this issue.

A sample of work from a resource package published by State Forests of NSW has been included. This is from an extensive collection of information and work sheets that was distributed to all schools several years ago, however, it was usually snapped up by Geography / HSIE.

Some detailed information on rice production is a major feature of this issue. The Cooperative Research Centre for Sustainable Rice Production is very enthusiastic about helping teachers and students with information or excursions. They have an Education Officer who can be contacted either through the centre or the web site.

The Australian Plants Society (formerly SGAP) is an extremely worthwhile organisation that provides information and practical assistance regarding all aspects of Native Plant production. Their members are very eager to help and are friendly toward schools. Membership is money well spent!

Best wishes to all the AGCampers! Until next issue.....Ed.

Contributions Needed:

Stuff to send:

School or Show Reports
Teaching Resources
AAT Branch Updates
Committee Reports
Inservice/ practical Ag info
Letters
Classifieds (ie Buy/Swap/Sell, etc)
Student Successes
Upcoming Events
Interesting Bits.....etc. etc.

e-mailed material in MS Word (pc) format, works best.
Pictures/photos in .jpg or .gif, if possible.

Contact or send material to the editor of your choice

President's Report

Welcome to the first but quite belated edition of BAAT for 2002.

Firstly I would like to thank Brigitte and her team for all the effort they put into BAAT, I am sure that all our members would be happy to extend thanks for all the hard work and effort that goes into getting BAAT out.

The conference committee headed by Ivan Gant is busy in the organisation of the 2003 conference, which will be held at "Tocal" Paterson on the 12th to 15th January 2003. The conference includes sessions on both Agriculture and Primary Industries courses, value adding of wine, cheese and olives as well as a number of short courses in areas such as management of internal parasites in sheep, organic farming, fencing, tractor safety and soil testing. I am sure it will be one of the best conferences yet and I suggest you jot down and reserve these dates for January 2003 now.

I would like to thank in advance all the staff from "Tocal" in particular Principal Cameron Archer and Deputy Principal Bill Kinsey for all the support they have given the association in the organisation of the conference. Tocal is an ideal place to take students in particular Primary Industries students to do a range of courses including Tractor Operation and Maintenance, SMARTtrain chemical course, fencing and Beef Cattle Handling and Management. If you would like to take you students to "Tocal" get in contact with Bill Kinsey and he will do all he can to accommodate you and your students.

The application forms and flyers for the conference can be found in this edition of BAAT. It would be appreciated by Ivan and all his team organising the conference if they could start to get replies as well as money as soon as is possible. This helps in the organisation and planning of the conference as well as allowing the committee to have money available to get the conference up and running.

In this edition of BAAT you will find the nomination forms for the JA Sutherland award and for Life membership of our association. There are countless members of our association who give up literally hundreds of hours of their own time to represent Agriculture teachers in a large numbers of areas and in large number of ways. The J.A Sutherland award and Life membership are ways in which we can, in a formal way acknowledge and thank members of our association for the hard work and effort they have put in over many years. I am sure we all know of many worthy recipients of these awards so I urge you to nominate any member of our association who you feel deserves to receive the JA Sutherland award and /or be bestowed life membership of our association.

The association has been extremely busy over the last 6 months in negotiation and discussions with the Board of Studies over the structure of our new Stage 4 and 5 Agriculture syllabus. The initial plans of the BOS was to only have stage 5 outcomes written in the new syllabus, which in effect would have prevented schools offering Agriculture in Years 7 and 8 as a stand alone subject. This decision would have had a major effect on all schools teaching Agriculture, in particular our 4 Agricultural High Schools.

As an association we felt that this issue was one that we must do all in our power to try and ensure that the BOS would reconsider its position on this issue and ensure that when the new syllabus was written that it contained both stage 4 and stage 5 outcomes.

In an effort to put our point of view across I wrote on behalf of the association to the following members of parliament. Mr. John Watkins Minister for Education and Training, Mr. Mark Vail Minister for Agriculture, Mrs. Patricia Forsyth, Shadow Minster for Education and Training, Mr. George Souris, Deputy Opposition Leader and Mr. Ian Armstrong Shadow Minister for Agriculture. I also wrote to the following members from the Office of the Board of Studies, Professor Gordon Stanley President of the BOS, Mr. John Ward, General Manger of the BOS, Mr. John O'Brien, Director Curriculum and Mr. Howard Kennedy, Inspector Technology.

The association was also fortunate to have a story, as well as an editorial appear in the Land Newspaper promoting our cause. The Land also ran 2 letters to the editor in following editions, commenting on the articles that appeared.

A number of our members where also very proactive in writing letters to members of Parliament, both local Members and Ministers, as well as to members of the Board of Studies and representatives from DET, Catholic Education and Independent schools. A meeting of various DET schools was also held where a response from DET was prepared which stated:-

The K-10 Curriculum Framework states that the mandatory study of technology curriculum will "be linked to Stage 4 standards, with elective study opportunities in these and other subjects linked to Stage 5 standards".

This statement does not prevent the writing of up to 400 hours (indicative) of Agriculture curriculum, linked to Stage 5 standards.

The 400 hours could be packaged as two courses, each course of up to 200 hours duration (allowing 100 hours study where appropriate).

"Agriculture 1" or *Agriculture standard* would be written with a discrete set of outcomes and content and with the intention of providing the foundation agriculture learning for students.

**Agriculture 2" or *Agriculture advanced* would provide additional study building on the outcomes achieved in Agriculture 1 and leading to a greater level of complexity, understanding and skill. The standard of achievement described for Agriculture 2 would be higher than Agriculture 1. Agriculture 1 would occur before Agriculture 2. Students from year 7-10 beginning agriculture for the first time would typically begin with Agriculture 1.

Where appropriate, up to 200 hours of Agriculture 1 could be taught to Years 7 and 8 students, allowing later progression into Agriculture 2.

The large amount of time and effort placed into these issues by members of association has resulted in me receiving a letter from Mr. John Watkins Minister for Education and Training, which in part states:-

Agriculture will continue as a stand-alone subject with its own syllabus for Year7-10. Rural and specialist high schools will be able to continue teaching Agriculture to years 7 and 8 students from a syllabus that includes stage 4 outcomes.

I would like to thank all the people who found the time to get in contact and offer support and feedback and in particular for the time and effort they have put into this issue, Ivan Gant, Graham Harris and Bob Guest who have worked tirelessly writing letters, attending meetings, talking to politicians and helping me, to ensure that we did everything we could to achieve an outcome that would suit all schools that teach Agriculture in the state.

Included in this edition of BAAT are copies of the letters and some of the replies we have received in response to the issues we raised as well as copies of the articles and letters that appeared in the Land.

Remember the Conference in January and get in contact with Ivan and his organising committee, if you wish to attend what I am sure will be a very enjoyable and rewarding conference.

It must be remembered that our role as executive members is to represent our members of our Association. If you as a member have any issues you would like to see addressed or in-services you would like to see ran please contact me at work on (02) 9816 1044, home (02) 9629 3833 or by fax or e-mail pamccann@bigpond.com.au It is my job as President to ensure that we are meeting the needs of every one of our members in every part of the state, so please give us some feedback so we can help you.

A reminder that BAAT is only as good as the contributions it receives. Please send submissions of any articles, resources, worksheets, programming ideas, and reports on your school or show results to Brigitte or Milton.

Patrick McCann

NOMINATIONS FOR LIFE MEMBERSHIP

I wish to call for nominations for Life Membership of the New South Wales Association of Agriculture teachers. The award of Life Member is to be made to a member of the association who has provided outstanding and long serving contribution to the Association and to Agriculture teaching.

Our Current life members according to the records that I have are:

Mr. Don Bartholomew

Mr. Norm Thomas

Mr. Norm Robinson

Mr. Ivan Johnson

Mr. Peter Lynes

If these records are incorrect please get in contact with me, and I will remedy any omissions in the next edition of BAAT.

Please send nominations to
Patrick McCann
St Joseph's College
Mark Street
HUNTERS HILL 2110
NSW

Life Membership Award

The criteria for the awarding of Life Membership of NSW Association of Agriculture teachers is as follows:-

i. Nomination by present financial members of the Association will be required on the nomination form enclosed in BAAT.

ii. Support materials must be provided together with referees, to enable a full resume to be developed and presented in BAAT.

iii. A summary of the resume is to be posted prior to the AGM at the biennial conference.

iv. Voting will be decided on a 2/3 majority of the members voting.

v. Successful members will become life members as of the date of the meeting, and be invited to receive their life membership at the following Biennial conference

Nomination for Life Membership

Name. _____

Address _____
_____
_____

Phone _____(H)
_____(W)

Name of person nominating _____
Signature _____

Address. _____
_____
_____

Phone (W) _____
(H) _____

Name of person seconding nomination _____
Signature _____

Address. _____
_____
_____

Phone (W) _____
(H) _____

Please attach supporting resume of person being nominated which will be published in BAAT as well as a brief summary resume, which will be posted prior to the AGM at the conference.

Correspondence Regarding Proposed Syllabus Changes

(On association letterhead)

Professor Gordon Stanley
President of the Board of Studies
Office of the Board of Studies
PO BOX 5300
SYDNEY NSW 2000.

Dear Professor Stanley,

I am writing to ask if it is possible for the Office of the Board of studies to reconsider its proposal to remove the stage 4 outcomes from the new stage 4/5 syllabus that is being re-written for Agriculture.

In our view it would have dramatic impacts on many students from both Rural and Remote areas and from urban and urban fringe schools. The decision also leaves a gap in educational scope and sequence.

This causes us grave concern, as it does not appear to have been discussed with either educators or community members.

We would like to address a number of issues for your consideration.

Many students from both rural and urban areas have a passion for agriculture, which they bring with them from their homes. They often have a future vocation in the Rural Industry already mapped out for them and see a study of Agriculture and the development of a skill base as being of fundamental importance to them. The brief encounters they have in the current Design and Technology courses do not suit the long-term nature of many agricultural production cycles and systems. A number of these students will not stay on to complete the HSC and/or will not be at school or at a school where they can study the Primary Industries Curriculum framework

The very practical nature of the stage 4 and 5 courses suits the learning style of students by being very hands on. This provides for the range of abilities and in many schools those students with low literacy skills can still meet many of the outcomes of the course and gain success, which enhances their self-esteem. In many cases it is one of the few courses that many students can see a clear purpose for an academic pursuit, which can result in some candidates remaining at school and or having higher attendance rates which have positive flow on benefits to other subjects.

At one school in rural NSW, which has a significant Aboriginal student population, student attendance levels of this group are low. It is often the case that at this school the students will turn up to one period in the day and that is their period of Agriculture. Students from an aboriginal background have an empathy with the environment and find the care of animals and the propagation and culture of plants very rewarding.

The provision of Agriculture as a stage 4 subject has important benefits for students from rural and remote areas when they attend schools as boarders. The students from remote areas have been placed in an environment, which is quite foreign to them. They are in much larger schools, isolated from family and pets and the daily activities of a farming household. The ability to work in the agriculture plots, tending animals and plants can form a powerful link with their home and allow a far less traumatic transition to boarding life. Their class peers from urban areas can then also appreciate the skills, which they bring with them, and this can help remove some of the stigma, which may exist for many remote students.

The ability of students to study a course in Agriculture from years 7 to 10 can allow a far richer experience in both the depth and breadth of their agricultural studies. This can have very positive effects on their future employment prospects and also allow them to study a far wider range of agricultural enterprises. This can have positive social and environmental effects in the local community and the family farm by allowing the transfer of new ideas and practices. The ability of students to carry out long-term trials on their own properties would be greatly diminished, as they would not be exposed to these skills until year 9 or 10. Often it is the education of the young student, which is the best way to induce change in rural areas. This has been repeatedly demonstrated in this school with new techniques such as reduced tillage, conservation farming, tree regeneration, more intelligent water use being transferred from the students undertaking these activities and then introducing them to their own farms.

If the board was to determine that stage 4 outcomes were not to be developed for Agriculture it would bring into question the role, function and ultimately the continuance of the 4 Agricultural High Schools in this state. There are also many Private schools, which have a significant amount of Agriculture from years 7 to 10 which will also be greatly affected by these proposed changes.

These changes would further erode the opportunities of students (particularly but by no means exclusively boys) from rural and remote areas to study courses that are appropriate to them and are seen to be relevant and practical. Indeed this simple act could further increase the sense of alienation of rural students and the lack of value of their skills in their intended vocation.

Having a relevant curriculum, which extends their skills and enhances the employment opportunities of both country and urban students is the only way Australia as a nation can hope to have sufficient trained and skilled people to allow Agricultural Industries to compete in a global marketplace.

If action is not taken we will face a rural crisis in having insufficient suitable trained farmers and advisors prepared to live and work in rural areas, just as we now face a crisis in rural medicine. We cannot afford to face the acute problems of Ireland with their inability to have sufficient rural employees (or farmers).

Most Agriculture teachers in NSW do not support this decision as seen from these comments received by the association from some of our members.

Yr 8 Ag is a fantastic taster for 9&10 Agriculture. Without it you simply will not get the interest in 9 & 10 Ag.

Having Agriculture, as part of the 7/8 D&T will just not be enough. It only gives them minimum exposure to the essence of Agriculture. It is also the schools TAS Dept that decides what contexts are covered in junior D&T, Agriculture could be missed, and the students can therefore miss out on Agriculture all together.

The role of Agriculture in western Sydney's low socio-economic schools is very important. It is in 23 high schools (west of Parramatta) because a regional director had a thought it could assist in the learning / development of kids in those schools.... and I think he was right.

I am vehemently against any thoughts of eliminating Stage 4 outcomes from the Agriculture syllabus in the belief that Agriculture is adequately covered in the D & T course. If anyone thinks that Agriculture is getting a fair run in D&T they need their heads examined. All you need to do is assess any school offering such a course and you will see Agriculture given such a wide berth that it misses altogether.

There should be no question that Agriculture, as a stage 4 and stage 5 subject, plays a pivotal role in the educational and social development of many students in both rural and urban Australia.

At the very least a much more thorough and widespread consultation with the relevant stakeholders must be conducted prior to any decision, which significantly alters the current structure of the syllabus, which is currently being considered.

The NSW Association of Agriculture Teachers are very concerned about the impacts of these changes and requests that the Board of Studies of NSW reconsider its proposal to remove stage 4 outcomes from the new Agriculture syllabus.

Yours sincerely

Patrick McCann
President
NSW Association of Agriculture Teachers.

N.S.W. Association of Agriculture Teachers Inc

ABN Number 81 639 285 642

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Hon John Watkins
Minister for Education and Training
Level 34
Governor Macquarie Tower
1 Farrer Place
SYDNEY 2000

Dear Mr Watkins,

At present the Board of Studies has an Agriculture syllabus, which can be taught in year 7 and 8 (stage 4), a course of study of 200 hours that is taught at each of the specialist NSW government Selective Agricultural High schools and also by a number of comprehensive and non government schools.

The stage 5 courses are also a 200-hour course studied over years 9 and 10 for the NSW School Certificate. This course is studied at many schools throughout NSW. These courses then lead to the Stage 6 Agriculture and Primary Industries courses.

The specialist Agricultural High Schools are often viewed as the jewels in the crown of the NSW Department of Education and Training. They are James Ruse (Sydney) a coeducational day school, Hurlstone (Glenfield, Sydney) a coeducational day and boarding school, Yanco (Leeton) a coeducational residential school and Farrer Memorial Agricultural High School (Tamworth) which is a boys day and residential school. These schools have a proud and long tradition of providing a specialist agricultural training in NSW. There are many eminent people involved in Agricultural industries that are products of this system.

These schools are important links in providing both studies of the science of agriculture and the practices of agriculture. Farrer and Yanco has a long tradition also of providing vocational training and has established formal links with leading organisations such as Fletchers International (Australia's largest sheep meat processor and exporter) and the Australian Agricultural Company for post

secondary training and employment. The transfer of new technologies and farming methods to the wider agricultural community from those practices used at the schools is very important.

The current proposed changes would see

- Abolition of Stage 4 Agriculture outcomes in the new syllabus.
- Conversion of Agriculture to an extension 100-hour course as part of the Design and Technology course.
- The need to teach Stage 5 outcomes to students in Year 7 and 8 at schools where Agriculture wishes to be taught in these years.
- The change of name to Agricultural Technology.

In our view these changes would have dramatic impacts on many students from both Rural and Remote areas and from urban and urban fringe schools. The decision also leaves a gap in educational scope and sequence.

This causes us grave concern, as it does not appear to have been discussed with either educators or community members.

We would like to address a number of issues for your consideration.

Many students from both rural and urban areas have a passion for agriculture, which they bring with them from their homes. They often have a future vocation in the Rural Industry already mapped out for them and see a study of Agriculture and the development of a skill base as being of fundamental importance to them. The brief encounters they have in the current Design and Technology courses do not suit the long-term nature of many agricultural production cycles and systems. A number of these students will not stay on to complete the HSC and/or will not be at school or at a school where they can study the Primary Industries Curriculum framework

The very practical nature of the stage 4 and 5 courses suits the learning style of students by being very hands on. This provides for the range of abilities and in many school students with low literacy skills can still meet many of the outcomes of the course and gain success, which enhances their self-esteem. In many cases it is one of the few courses that many students can see a clear purpose for an academic pursuit, which can result in some candidates remaining at school and or having higher attendance rates which have positive flow on benefits to other subjects.

At one school in rural NSW, which has a significant Aboriginal student population, student attendance levels of this group are low. It is often the case that at this school the students will turn up to one period in the day and that is their period of Agriculture. Students from an aboriginal background have an empathy with the environment and find the care of animals and the propagation and culture of plants very rewarding.

The provision of Agriculture as a stage 4 subject has important benefits for students from rural and remote areas when they attend schools as boarders. The students from remote areas have been placed in an environment, which is quite foreign to them.

They are in much larger schools, isolated from family and pets and the daily activities of a farming household. The ability to work in the agriculture plots, tending animals and plants can form a powerful link with their home and allow a far less traumatic transition to boarding life. Their class peers from urban areas can then also appreciate the skills, which they bring with them, and this can help remove some of the stigma, which may exist for many remote students.

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If the board was to determine that stage 4 outcomes were not to be developed for Agriculture it would bring into question the role, function and ultimately the continuance of the 4 Agricultural High Schools in this state. There are also many Private schools, which have a significant amount of Agriculture from years 7 to 10 which will also be greatly affected by these proposed changes.

These changes would further erode the opportunities of students (particularly but by no means exclusively boys) from rural and remote areas to study courses that are appropriate to them and are seen to be relevant and practical. Indeed this simple act could further increase the sense of alienation of rural students and the lack of value of their skills in their intended vocation.

Having a relevant curriculum, which extends their skills and enhances the employment opportunities of both country and urban students is the only way Australia as a nation can hope to have sufficient trained and skilled people to allow Agricultural Industries to compete in a global marketplace.

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There should be no question that Agriculture, as a stage 4 and stage 5 subject, plays a pivotal role in the educational and social development of many students in both rural and urban Australia.

At the very least a much more thorough and widespread consultation with the relevant stakeholders must be conducted prior to any decision, which significantly alters the current structure of the syllabus, which is currently being considered.

The NSW Association of Agriculture Teachers asks you as the Minister for Education and Training to make approaches to the Board of Studies of NSW to ask it to reconsider the proposal to remove stage 4 outcomes from the new Junior Agriculture syllabus.

Your Sincerely

Patrick McCann
President
NSW Association of Agriculture Teachers



PARLIAMENT OF NEW SOUTH WALES
LEGISLATIVE ASSEMBLY

The Hon Ian Armstrong OBE MP FAICD
Member for Lachlan

135b Kendal Street
(PO Box 310)
COWRA NSW 2794

Tel: (02) 6342 4911
Fax: (02) 6342 4524

E-mail Address
ian.armstrong@parliament.nsw.gov.au

2/05/2002

Mr Patrick McCann
President
NSW Association of Agriculture Teachers Inc
St Josephs College
HUNTERS HILL 2110

Dear Mr McCann

Thank you for your recent letter regarding the removal of Stage 4 Outcomes from the new Junior Agriculture syllabus.

I note your concerns and wish to advise I have written to the Minister for Education seeking him to reconsider this proposal.

I shall also be raising this matter in the Parliament when it resumes next week.

When the Minister's reply is to hand, I shall be in contact with you again.

Yours faithfully

IAN ARMSTRONG OBE MP
Member for Lachlan
Shadow Minister for Agriculture
Shadow Minister for Racing

Pushing the Positives

Dropping ag foolish move

THE move by the Board of Studies to drop agriculture from the Stage 4 (Years 7 and 8) syllabus offered in many NSW high schools and colleges is unwise and shouldn't be tolerated by the broader community.

Agriculture should be promoted as a subject in our secondary schools, but it has already been marginalised through its incorporation into the Design and Technology courses in Years 7 and 8 in many schools.

Now the Board of Studies wants agriculture completely dumped as a stand-alone subject in Years 7 and 8 and only offered as part of a school's Design and Technology curriculum, which also includes courses such as industrial arts, home science and computers (creating a high risk that agriculture will disappear from more high schools because there will be no compulsion on principals to offer the course).

Putting aside what this would mean for the future of NSW's specialist agricultural high schools, clearly there is a push to diminish the merit of agriculture as a secondary school subject.

And we believe this push is foolish, short-sighted and mean-spirited.

If the president of the Board of Studies, Professor Gordon Stanley, visited this month's Sydney Royal Show he would have seen the increasing and exciting involvement of school students there. These students are learning about agriculture through a mixture of hands-on practical experience and expert advice. It's a learning style essential for farming because of the need to mix muscle with brain power.

Perhaps it's a learning style that is applicable also to much more than agriculture.

The availability of agriculture in Years 7 and 8 provides students with a "teaser" to see if they are suited to a rural career.

Without this, fewer students are likely to pursue agriculture in Years 9 and 10 or the Primary Industries curriculum for the Higher School Certificate.

This almost certainly will result in a loss of potential entrants into Australia's exciting and critically important agriculture sector. Not a sensible national outcome, surely?

There are also other factors to consider. Not every student is academically inclined, which means they aren't always "turned on" at school. Agriculture provides these students with a "release valve" by allowing them to get outside for a period to "work in the dirt" looking after animals and crops on the school farm.

And agriculture has also been found to be an attractive subject for some disadvantaged children, including Aborigines, who enjoy the practical side of agriculture and are able to benefit from bonding with farm animals.

This is one reason why agriculture is available in 23 high schools west of Parramatta on Sydney's fringes.

The Board of Studies should take off its blinkers in order to see the many values of offering agriculture in our secondary schools.

Years 7-8 ag 'under threat' claim

By BEN HOUSTON

FEARS surfaced this week about the future of NSW's specialist agricultural high schools, because of claims that agriculture is about to be dumped as a stand-alone subject in Years 7 and 8.

The worries have been prompted by a NSW Board of Studies review of all courses offered from Years 7 to 10.

The Land has obtained a draft letter to Board of Studies president, Professor Gordon Stanley, from the president of the NSW Association of Agriculture Teachers, Patrick McCann (St Joseph's College, Sydney), expressing concerns about the possibility of agriculture being scrapped in the early high school years.

"In our view, (abolishing agriculture as a Stage Four course in Years 7 and 8) would have dramatic impacts on many students from both rural and remote areas and from urban and urban fringe schools. The decision also leaves a gap in educational scope and sequence," Mr McCann wrote.

NSW National Party leader, George Souris, said any decision to go down that path would mean "many, many schools in country NSW" would lose a teaching option relating to the major industry in their areas — agriculture.

Mr Souris said it was inconceivable that a selective agricultural high school would not teach agriculture as a core subject in Years 7 and 8 "and only offer agriculture to Year 7 and 8 students as part of Design and Technology."

However, staff in the office of Education Minister, John Watkins, said their advice from the Board of Studies was that there were no plans to downgrade agriculture in Years Seven and Eight.

Office of the Board of Studies general manager, John Ward, confirmed a review of all subjects was under way, but stressed agriculture would continue to be offered as a stand-alone syllabus in Years 7 to 10.

LEFT: NSW National Party leader, George Souris, says the future of agriculture as a subject in the early years of high school is under threat.

Mr Ward said fears agriculture would only be offered in Years 7 and 8 as a module of the Design and Technology course (which happens now in many high schools) were ill-founded.

NSW has four agricultural high schools: Farrer Memorial at Tamworth, Yanco in the Riverina and James Ruse and Hurlstone in Sydney.

Belated reassurance

SIR: I was bewildered by the comments attributed to John Ward, general manager of the Board of Studies and the office of the Board of Studies ("Years 7-8 ag 'under threat'", *The Land*, April 18, p19).

The claims that "there were no plans to downgrade agriculture in Years 7 and 8" and "fears agriculture would only be offered in Years 7 and 8 as a module of design and technology were ill-founded" are untrue and misleading statements.

In the Report on the Development of a K-12 Technology Statement, published by the Board of Studies in February, 2002, p14 states: "Some schools have expressed a need to offer agriculture from Years 7 to 10 for up to 400 hours.

"This flexibility can be achieved by:

- offering students an additional 100 hours of extension in the mandatory stage four technology syllabus in relation to the agricultural design area of study and its associated content, and
- offering an additional 100 hours of options from the agricultural technology elective course which links to stage five outcomes (300 hours in Years 8-10).

As can be seen from the above statement there is no possibility of a school being able to offer agriculture as a stand-alone subject in Year 7 — the only option is as a part of design and technology — and in Year 8 the proposal was to teach the students stage five outcomes, which are developed for Year 9 and 10 students.

In my opinion this is a quite obvious downgrading of agriculture in Years 7 and 8.

At a number of meetings and discussions I have had with members of the Board of Studies and officers of the Board of Studies it was made clear to me on a number of occasions that the Board of Studies was proposing that there would not be stage four outcomes written for the agriculture course, thereby preventing agriculture being "able to be offered as a stand-alone syllabus in Years 7 to 10".

It seems from the statements made by Mr Ward that at these meetings it would have been quite possible for one of the members of the Board of Studies or a board officer to have allayed all our concerns as agriculture teachers and given us the assurance that there would be stage four outcomes included in the new syllabus, allowing the flexibility for schools to, as is currently the case, teach agriculture as a stand-alone subject from Years 7 to 10.

My question to you, Mr Ward, is why was not this assurance given earlier, if this was always the intention of the Board of Studies?

I am sure all agriculture teachers in NSW are now pleased that our new agriculture 7-10 syllabus will contain both stage four and stage five outcomes, allowing us to teach agriculture from Years 7 to 10 as a stand-alone subject.

PATRICK McCANN,
Head teacher,
Agriculture,
St Joseph's College,
Hunters Hill.

Slap for agriculture

SIR: Ben Houston's story, "Years 7-8 ag 'under threat' claim" (*The Land*, April 18, p18) prompted me as a Year 11 student from Hurlstone Agricultural High School to express my sorrow at this prospect for future generations.

Agriculture is one of the most important areas of our society and it's here in our education system that we find an appreciation for it.

The biggest drawcard for me, as an 11-year-old, to move off the farm and into a Sydney boarding school was agriculture.

Many students who attend Hurlstone would most likely never experience any aspects of agriculture if not for this subject, which is mandatory for students from Years 7 to 10. Because of this many students choose to pursue agriculture in their Higher School Certificate years.

This year's Sydney Royal Easter Show saw a major push to publicise agriculture in our public schools, so why now do they slap us in the face and even consider dropping agriculture as a stand-alone subject in our education system?

KELLIE COOKE,
Berry Park.

Source: The Land

NOMINATIONS FOR THE J.A SUTHERLAND AWARD

For excellence / contribution to Agricultural Education in NSW Secondary schools

The most prestigious award that can be awarded to any teacher of Agriculture in NSW is the J. A. Sutherland Award.

The J.A Sutherland award is named after Allan Sutherland a man that the younger Agriculture teachers including myself never had the opportunity to meet.

I was looking through some old editions of BAAT and in the first edition of 1983, I found a tribute and the curriculum vitae of J. A Sutherland written by the President of our Association at the time and lifemember of our Association Mr. Norm Thomas.

I was amazed at the achievements of Alan Sutherland and can only be in awe of the influence that he had on Agricultural Education, not only in NSW but also all through the Pacific and the world.

I am sure that every Agriculture teacher would be happy to only achieve fraction of what Allan achieved in his life and to be able to have been an important part in the development of Agricultural Education in NSW.

I am sure that the only reason as to why NSW is seen as one of the leaders in Secondary Agricultural Education is due to men such as Allan Sutherland.

I thought it appropriate that the younger Agriculture teachers of our Association become more aware of who the J.A Sutherland award is named after come to recognise what an honour and privilege it is to be awarded the J. A Sutherland Award. The last three recipients of the J. A Sutherland Award are:-

1997	Mr. Peter Jones
1999	Dr Rod Francis.
2001	Jenni Wilkins

A TRIBUTE TO ALAN SUTHERLAND

(From BAAT No 1 1983)

Dear Colleagues,

On the 21st of December last year, we were informed of the passing of our patron - Alan Sutherland. He had, until a few weeks prior, been actively working at the University of New England.

His demise has left a large gap in the ranks of Agricultural Educationalists in both Australia and the pacific region. Such Men as Alan are irreplaceable. He was an educator, artist and author. His publications have been of immense value to all schools and colleges. Alan's activities are so extensive that a special section is devoted to them.

All people who were privileged to meet him remember his lively and spectacular presentation of ideas. Those who were seated near him at functions often souvenir his humorous illustrations of some aspect of the proceedings.

Many of our members have expressed a desire to contribute to a memorial. This is something which will need to be discussed at our conference in May. Suggestions as to the form are varied. Most feel that it should be an award to a member of our Agricultural Teachers Association because of Alan's interest in the training of Agricultural teachers. If such were to eventuate, what criteria could be used? Others have expressed the idea of a Sutherland Oration to be given at each Biennial Conference. Please give the matter full consideration.

Condolences to Alan's wife, Sheila, son Hamish and daughter Isabel have been expressed on behalf of the Association.

Regards,

N.R. Thomas
PRESIDENT

OVERSEAS WORK OF J. A. SUTHERLAND

Mr. Sutherland made his first contribution to agricultural education in the Pacific in 1967. In that year, he was invited by the South Pacific Commission in Noumea to make a survey of agricultural education in the Pacific and to write a report. This report was published in 1968.

Subsequently he has been employed several times as consultant by the South Pacific Commission.

In 1972, he made an important contribution by writing a textbook called Introduction to Tropical Agriculture which is used in schools and colleges throughout the whole pacific region.

HI made his greatest contribution between the years 1973 and 1976 when he was employed by A.D.A.B. of Foreign Affairs as a consultant in agricultural education to the Ministry of Education in Fiji. The agricultural projects he wrote and illustrated were very successful and attracted a great deal of attention by the other countries of the South Pacific. After his Fiji contract was extended on two occasions, he returned to Australia for family reasons.

However, he was then invited by both the University of New England and the Australian Development Assistance Bureau to continue writing agricultural projects for the various Pacific Islands. He has now completed 38 such projects for use in schools of Vanuatu, Solomons, Tonga, Cook Islands, Tuvalu, Kiribati Since all these Countries have included the teaching of agriculture in school curricula, the written project notes have made a major contribution. He has also conducted In-Service courses for teachers in the different islands. Sutherlands work in the Pacific Islands has been described by A.D.A.B. of the Department of Foreign Affairs as an important contribution.

J.A SUTHERLAND

EDUCATION: Wagga Wagga High School, Sydney University, and University of New England

DEGREES: Bachelor Science Agriculture. Bachelor of Arts (Honors Degree)

AWARDS: 1970 - Fellow Australian Institute of Agricultural Science
1971 - Fellow of Australian College of Education.

APPOINTMENTS:

1935	Teacher of Agriculture, Kyogle Intermediate High School
1936	Junior Lecturer in Agriculture, Armidale Teachers College
1940-45	War service. RAAF Squadron Leader
1946	Teacher of agriculture, Lismore High School
1947	Lecturer in Agriculture, Armidale Teachers' College
1950	Senior Lecturer in Agriculture and Head of Science Dept., Armidale Teachers College
1962	Member of N.S.W. Agricultural Colleges Advisory Board. Member, Agriculture Syllabus committee, Secondary Schools Board
1963	Member, Agriculture Syllabus Committee, Board of Senior School Studies.
1967	Consultant in agricultural education to South Pacific Commission
1969	Acting Vice Principal, Armidale Teachers' College

1970	Leader of Australian delegation to First World Conference on Agricultural Education, Copenhagen.
	Acting Vice Principal, Armidale Teachers College for 2nd Term.
1972	Acting Vice Principal, Armidale Teachers' College for 3rd Term
	Australian Consultant on Agricultural Education to Conference at South Pacific Commission, Noumea.
1973	Australian Consultant in Science Education to U.N.D.P. Conference at University of South Pacific, Suva, Fiji
	Appointed by Dept.Foreign Affairs (ADAB) as Adviser in Agricultural education to Ministry of Education Suva, Fiji
1977	Appointed University Fellow, university of New England
1978	Consultant in Agricultural Education at Conference of Teachers' Colleges Lecturers in Agriculture at Lae, PNG, 1-5 May
	Consultant in agricultural education at International Training Course in Poultry Husbandry sponsored by ADAB and held at University of New England 20 April 1978.

BOOKS PUBLISHED:

1962	Introduction to Agriculture, Angus & Robertson 1964 - The Rocks, Wentworth Press, Sydney
1968	Understanding Farm Animals, McGraw-Hill
1971	Introduction to Tropical Agriculture, McGraw- Hill
1974	Rural Life. Angus and Robertson 1976
	Vegetable Growing. Ure Smith
1980	Introduction to Agriculture, 6th edition, McGraw - Hill.

MONOGRAPHS:

1968	Agricultural Education in the South Pacific. South Pacific Commission

PAPERS PUBLISHED:

1964	Practical Work in Agricultural Education. Journal of Australian Institute of Agricultural Science, 30. 2.
1965	Agricultural Education in Secondary Schools. Annual Conference of Australian Institute of Agricultural Science.
1966	Agricultural Education. In N.S.W. Education Gazette, 1st April,-1966.
	Agricultural Education in Secondary Schools. Journal of South Australian Science Teachers Association.
1968	Careers in Agricultural Science. Published by Australian Institute of Agricultural Science.
1970	With J.L. Dillon, co-author of The Situation, Problems and New Trends in Agricultural Education in Australia and New Zealand. Background paper to First World Conference on Agricultural Education and Training. Copenhagen
1971	Training Teachers of Agriculture in Australian Education and Training. - Annual Review of Selected Developments. F.A.O. Rome, 1971.
	World Conference on Agricultural Education and Training. Journal of Australian Institute of Agricultural Science, March, 1971.
1974	The Place of Agriculture in the School Curriculum. in "Educational Perspective in Papua New Guinea" Australian College of Education.

1978 Education in Agriculture: The Role of the Teacher in Overseas Agricultural Development, in Proceedings. Conference of Australian Association of Agricultural Faculties, UNE., February 1978.

1979 Utilisation of Resources for Agricultural Education in Agritalk (Journal of Victorian Agricultural Teachers Assoc.) 1980:2.

1971 Present and Future Demand for Agricultural Graduates. Read at Conference of Australian Association of Agricultural Faculties at Sydney University.

1972 General Principles of Agricultural Curriculum Development. Read at Conference at South Pacific Commission, Noumea.

1973 Principles of Curriculum Construction in Science. Read at UNDP Seminar, University South Pacific.

1977 Modern Studies - A New Approach to School Agriculture in Fiji, Resources in Agricultural Development Programs. University of New England.

Changing Patterns-of Secondary Education in the Pacific Islands. Paper read at meeting of N.S.W. Chamber of Australian College of Education, Sydney, 20th October, 1977.

1978 Papers read at International Training Course in Poultry Husbandry, University of New England, April/May 1978:

a. Education for Change

b. Use of local materials for Poultry Housing

Curriculum Development in Papua New Guinea - some Suggested Guidelines. Paper read at Conference of Teachers' College Lecturers in Agriculture, Lae, May 1-5, 1978.

1979 Utilization of Resources for Agricultural Education. Paper read at O.E.C.D. Conference on Rural Education, Perth, Nov.1979.

REVEIWS

1968 Review of Agricultural Education in Australia 'by R.N. Farquhar, A.C.E.R. in Journal of Australian Institute of Agricultural Science.

1977 Review of Organizational Genesis and Development: A Study of Australian Agricultural Colleges by A.W. Black, University of Queensland Press, published in Journal of Educational Administration, XV-1.

NOMINATIONS FOR THE J.A SUTHERLAND AWARD

For excellence / contribution to Agricultural Education in NSW Secondary schools

The criteria for the awarding of the J. A. Sutherland Award are as follows:-

i. The Alan Sutherland Memorial Award be presented to an Agriculture teacher judged to have made a significant contribution to the teaching of Agriculture;

ii. The recipient be a secondary school teacher who is a member of the NSW Association of Agriculture Teachers;

iii. The award be judged by a committee comprising the executive of four and two members nominated by the committee;

iv. Nominations for the award be made by any member or group of members in writing at least three months prior to the Biennial Conference;

v Nominations or a summary of nominations to be included in the Association Newsletter prior to the Biennial Conference;

vi. The judging committee reserves the right not to make an award in any Biennial; the award takes the form of -

a) a perpetual trophy inscribed with the name and year of the recipient, an
b) a personal award to the recipient;

vii. in the event of the Biennial conference not being funded, the award be made and the members advised in the next edition of BAAT.

A significant contribution should include -

- *a work or event from which many benefit*

OR

- *an outstanding worker*

OR

- *an innovation*

Please send nominations to
Patrick McCann
St Joseph's College
Mark Street HUNTERS HILL 2110

Include name of the member nominating the teacher for the award plus the name of the member who is seconding the nomination.

WANTED:

INPUT

REWARD:

INTERESTING READ

NSWAAT Biennial Conference

LOCAL

JAN 12-15

2003

NSWAAT Biennial Conference Program

January 12 – 15, 2003

Sun 12		Mon 13		Tue 14		Wed 15	
3:00 – 5:00pm	Registration at Tocal Agriculture College, Patterson NSW	8.30 – 9.00am	Registration	9.00 – 12.00 VET & Ag work-shops	Management of internal parasites in sheep and cattle (Worm egg count, **1 day course**)	9.00– 12.00 VET & Ag work-shops	Succeeding at the HSC, Stage 6 Agriculture – Markers comments – Understanding the syllabus – Answering questions
		9.05 – 9.15am	Official welcome – Cameron Archer, Principal Tocal College		Organic farming - game birds and cropping (**1/2 day course**)		Succeeding at the HSC, Stage 6 Primary Industries – Markers comments – Understanding the syllabus – Answering questions
		9.20 – 11.30am	Succeeding at the HSC, Stage 6 Agriculture – Markers comments – Understanding the syllabus – Answering questions		Fencing workshop - sponsored by Waratah (**1/2 day course**)		
					Tractor safety training (**1/2 day course**)		
			Succeeding at the HSC, Stage 6 Primary Industries (VET) – Markers comments – Understanding the syllabus – Answering question		Soil testing in the field - Haynes Farm Supplies Coolah (**1/2 day course**)		Sustainable pasture management NSW Agriculture (**1/2 day course**)
							Organic farming – game birds and cropping (**1/2 day course**)
		11.30 – 12.30pm	Lunch	12.00 – 1.00	Lunch	12.00 – 1.00	Lunch
		12.30 – 6.00pm	Value adding to agricultural products: – Wine production, Garry MacLean, Rothbury – Fordwich, olives, Andrew White – Cheese Factory, Pokolbin	1.00 – 5.00	Management of internal parasites in sheep and cattle (Worm egg count, **1 day course**)	1.00– 2.30	AGM – Finish
					Organic farming – game birds and cropping (**1/2 day course**)		
					Fencing workshop - sponsored by Waratah (**1/2 day course**)		
					Tractor safety training (**1/2 day course**)		
					Soil testing in the field – Haynes Farm Supplies Coolah (**1/2 day course**)		
		6.30 – 9.00	Dinner Harrigan's Hotel	7.00 – 10.00	Conference dinner		

FACT SHEET 11.3A



A landslip on the edge of the Snowy Mountains Highway, Brown Mountain, near Bega in southern New South Wales. Trees offer support to soil, thereby reducing erosion and landslips.

LAND DEGRADATION

Much of Australia's land cleared for agricultural purposes is threatened by *land degradation*, in particular *erosion* by wind and water resulting in the loss of valuable fertile topsoil, or *rising watertables* resulting in waterlogging and salinisation of the land.

Land degradation refers to the *decline* in the *quality* and *quantity* of land, usually as a result of disturbances through human activity. The main types of degradation are:

- *water erosion*
- *wind erosion*
- *dryland salinity*
- *irrigation salinity*
- *soil acidity*
- *soil structural decline.*

Figure 11.3.1 describes these types of land degradation.

FIGURE 11.3.1 TYPES OF LAND DEGRADATION

Land degradation is the decline in the quality and quantity of land, commonly caused by improper use. In 1978, more than half of Australia's farming and grazing lands were affected by land degradation. The figure is now about two-thirds. Land degradation in Australia costs an estimated $600 million a year and is a problem that should concern all Australians.

The main types of degradation are:

Water erosion



This is the loss of soil through contact with water. It is made worse by clearing trees which hold the soil together. It can easily be seen in sloping country in the form of gullies. Water erosion strips the topsoil, leaving water-resistant subsoil at the surface. This limits crop and pasture growth. In some farming areas of Australia, water erosion is removing up to 200 tonnes of soil a hectare each year which is the equivalent of 20 millimetres of topsoil across the land.

Wind erosion



This occurs mainly in dry or drought-stricken country where sandy and other light soils (left unprotected) are blown away by the wind. Apart from drought, the problem may be made worse by overgrazing of stock or animals such as rabbits and kangaroos. Beach dunes may also be affected by wind erosion and housing development. Vehicles such as dune buggies may strip the vegetation, causing the erosion.

Dryland salinity



This is caused by the clearing of native trees and grasses by humans. The watertable (see Figure 11.3.2) which was kept low by the "biological pumps" (trees and grasses) rises, collecting salt in the rocks and sediment. The salt may rise to the surface, ruining the land for normal crops and pasture and killing the remaining trees.

Irrigation salinity



This is caused by poor land drainage and too much water being used for irrigation. The irrigation water brings dissolved salts to the surface. Along the Murray River this type of salinity reduces crop production by an estimated $65 million a year.

Soil acidity



The normal practice of using some types of clover and phosphate-rich fertilisers on farms has been found to increase the acidity of many of Australia's fragile and infertile soils. This acidification can reduce agricultural yields up to 50 per cent.

Soil structural decline



This is the destruction of the soil structure by farming techniques. These techniques, including continual ploughing, break down the soil particles, causing the problems. As a result, crop and pasture yields decrease and soils become prone to water erosion.

Reference: Keep Australia Beautiful. An environmental education resource.





Bank erosion, as shown in the photograph of Candelo Creek in New South Wales (above), and farmland erosion (right) result in the loss of valuable soil and land. These two types of erosion can be prevented or reduced with improved vegetation cover.

Source p27-32: *Forest Management in NSW: a Manual for Teachers and Students.* Allotta, Elizabeth. Published by State Forests of NSW, Pennant Hills, 1996

FACT SHEET 11.3A

EROSION

Clearing land of its vegetative cover exposes the nutrient-rich topsoil layer to water and wind which rapidly removes this layer, causing a reduction in land productivity. To *control* soil erosion we need to replace the ground cover and plant trees.



Gully erosion (above and below) is a severe form of land degradation in Australia, largely due to water flow.



SUGGESTED ACTIVITIES

1. Student worksheet: a rising tide. Sowing the seeds of change, pp 157-158.
2. Activity Sheet 11.3.1.

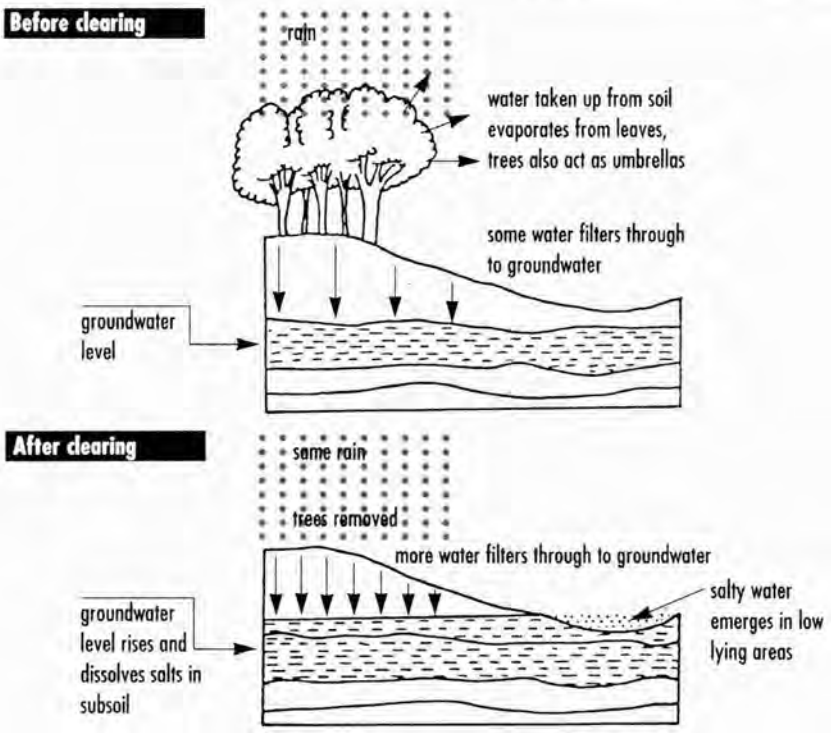
SALINISATION

Salinisation is one of Australia's biggest environmental problems. Not only does it have drastic effects on the environment, but it also affects our agricultural and pastoral industries. There are two main types of salinisation – *irrigation salinity* and *dryland salinity*. *Irrigation salinity* occurs in areas where irrigation water contains large quantities of dissolved salts, irrigation practices are inefficient or the drainage is not appropriate and evaporation results in the build-up of salts in the soil. The increase in *soil salinity* (salt content) directly damages or kills growing plants. In order to rehabilitate the soil the excessive salts need to be removed from the root zone. To

FURTHER READING

- Blood of a nation. The Helix. 17, pp 11-13.
- Pressures on our sick soil steadily rise. (5 June 1992) The Australian.
- Soil damage threat to food. (5 June 1992) The Sydney Morning Herald.
- Surface area and soil. The Helix. 17, p 10.
- United attack is making ground against erosion. (9 March 1993) The Sydney Morning Herald, p 12.

FIGURE 11.3.2 HOW TREE CLEARING MAY CAUSE SALINITY



Reference: Keep Australia Beautiful. An environmental education resource
Source: Teacher resource kit. Denise Pleming. Soil Conservation Service of NSW. Wagga.

FACT SHEET 11.3B

remove these salts the watertable needs to be lowered through efficient land use, such as replacing the original vegetation, and by efficient water management.

Over-fertilisation and excessive use of pesticides also result in reduced soil productivity. If left unchecked these processes ultimately lead to *desertification*, that is the land becomes arid and can no longer be cultivated.

Dryland salinity is the result of the clearing of vegetation from areas of land, usually extensive clearing over areas of appreciable size. Clearing of trees causes water normally absorbed by tree roots to filter into the watertable, causing it to rise, dissolving soil salts in the process and bringing these up to the root zone of the trees. The presence of increasing amounts of salts in the root zone can kill the trees and other plants.

Wetlands salinity is another type of salinisation. It is caused by a rising watertable of saline groundwater or by surface runoff after rain that carries dissolved salts from the surface of nearby land areas, in particular surrounding agricultural areas. Clearing of native vegetation for agriculture in areas surrounding fresh water wetlands has caused salination, waterlogging and flooding of the wetlands. This leads to the death of trees through the increased salinity of the wetlands water, water remaining on the land for longer periods of time and, in some cases, increased volume of water. These changes in turn affect native wildlife, in particular waterbirds that rely on the wetlands for habitat and breeding.

FURTHER READING

- Dryland salinity. Soil Conservation Service of New South Wales.
- Fact Sheet 3: Dryland salinity. Salt Action.
- Fact Sheet 4. Irrigation Salinity. Salt Action.
- Fact Sheet 5. River Salinity. Salt Action.
- How to identify and measure salinity problems. New South Wales Salinity Control Strategy.
- Irrigation Salinity. New South Wales Salinity Control Strategy.
- Pines an answer to salinity. (18 March 1991) The Queanbeyan Age.
- Recovering Lake Toolibin. (Spring 1994) Landscope, pp 41-44.
- Salt Action. How can it help you? What can you do? New South Wales Salinity Control Strategy.
- Selecting trees for salt-affected land. (Autumn 1994) ECOS. 79, p 7.
- The scourge of salt. The Helix. 16, p 16.



Land clearing and other agricultural practices, including the use of chemical fertilisation, are resulting in land and waterway degradation, such as eutrophication — the overgrowth of aquatic vegetation in the presence of high nutrient levels.

FACT SHEET 11.4



DIEBACK

Severe dieback results in the death of trees.

An example of a major *ecological change* in Australia is the *clearing* of large areas of forested land to create farmland. Native vegetation, which provided shade, protection from wind, wildlife habitat, food and scenic beauty, has been extensively cleared to make way for modern agricultural crops and grazing.

While a few trees have been retained in some cleared areas, the environment of these trees has been substantially changed as a result of the clearing of the surrounding vegetation. The resulting environmental changes, in turn, place *stress* upon the remaining (remnant) trees, such as:

- increased pest attack as a result of reduced food sources and biological control
- changes in soil conditions such as salinity
- increased susceptibility to weather conditions through increased exposure
- low regrowth due to reduced protection of young seedlings.

These stresses slowly lead to the death of these remnant trees, which is known as *dieback*.



Extensive agricultural land clearing and ringbarking are the most common causes of forest and vegetation loss in New South Wales.

SUGGESTED ACTIVITIES

1. Activity Sheet 11.4.1.

DID YOU KNOW?

The term *dieback* refers to the widespread death of native trees in an area. The cause of dieback can be difficult to identify as it may result from many environmental changes over a long period of time.

State Forests researchers are applying futuristic technology to help save dying trees in rural areas in south-western NSW. Individual trees are studied using highly-sensitive electronic probes which are attached to the trunk of each tree being studied. The flow of fluid from the roots to the leaves of a tree is measured in the same way that a person's blood pressure is checked. Data is being collected from over 150 trees on selected sites throughout the district as part of a major research project on dieback. Selected trees are being injected with insecticide to see if tree health improves when the stress of insect attack is removed. This research project is being conducted by State Forests in association with a local Landcare group and with the aid of funds from the National Landcare Program.



Dieback near Orange in central western New South Wales.

FACT SHEET 11.4

Dieback can also occur in native forests as a result of *environmental stresses* experienced by the trees. A major cause of dieback in native forests is fungal disease. In New South Wales, however, dieback largely occurs in rural areas and is thought to relate to agricultural management practices. The death of trees in an area has major effects on animals which rely on the trees for habitat and food supply.



▲ *A tree which has died from dieback on agricultural land in New South Wales.*

DID YOU KNOW?

Dieback amongst eucalypts

One cause of dieback, which notably affects jarrah (*Eucalyptus marginata)* forests of Western Australia, is the fungus *Phytophthora cinnamomi*. This eucalypt species has suffered badly from dieback caused by this fungus, which lives in soil and affects tree roots, eventually leading to the tree's death. Forest quarantine measures have been implemented to restrict the spread of this disease.



Dieback in the Hunter Valley, near the central coast of New South Wales.



One of the signs of dieback is the gradual deterioration and loss of tree crown.

FURTHER READING

- Dieback: a serious problem for farm management. (1983) Forest and Timber. 19(2), p 21.
- Dieback X-36. State Forests of NSW.
- Eucalyptus dieback on the northern tablelands of NSW. (1993) The Water Board. Case Study One.
- Of dieback, koalas and the Greek fighting forces. (Winter 1993) Between the leaves, pp 16-17.
- Rural dieback. The Helix. 17, p 15.

FACT SHEET 11.5

URBANISATION

Urbanisation refers to the increase in concentration of housing, industry, commercial business, schools and roads in an area.

The development of urban areas takes place on cleared land and both the development and use of an urban area have significant *impacts* on the environment.

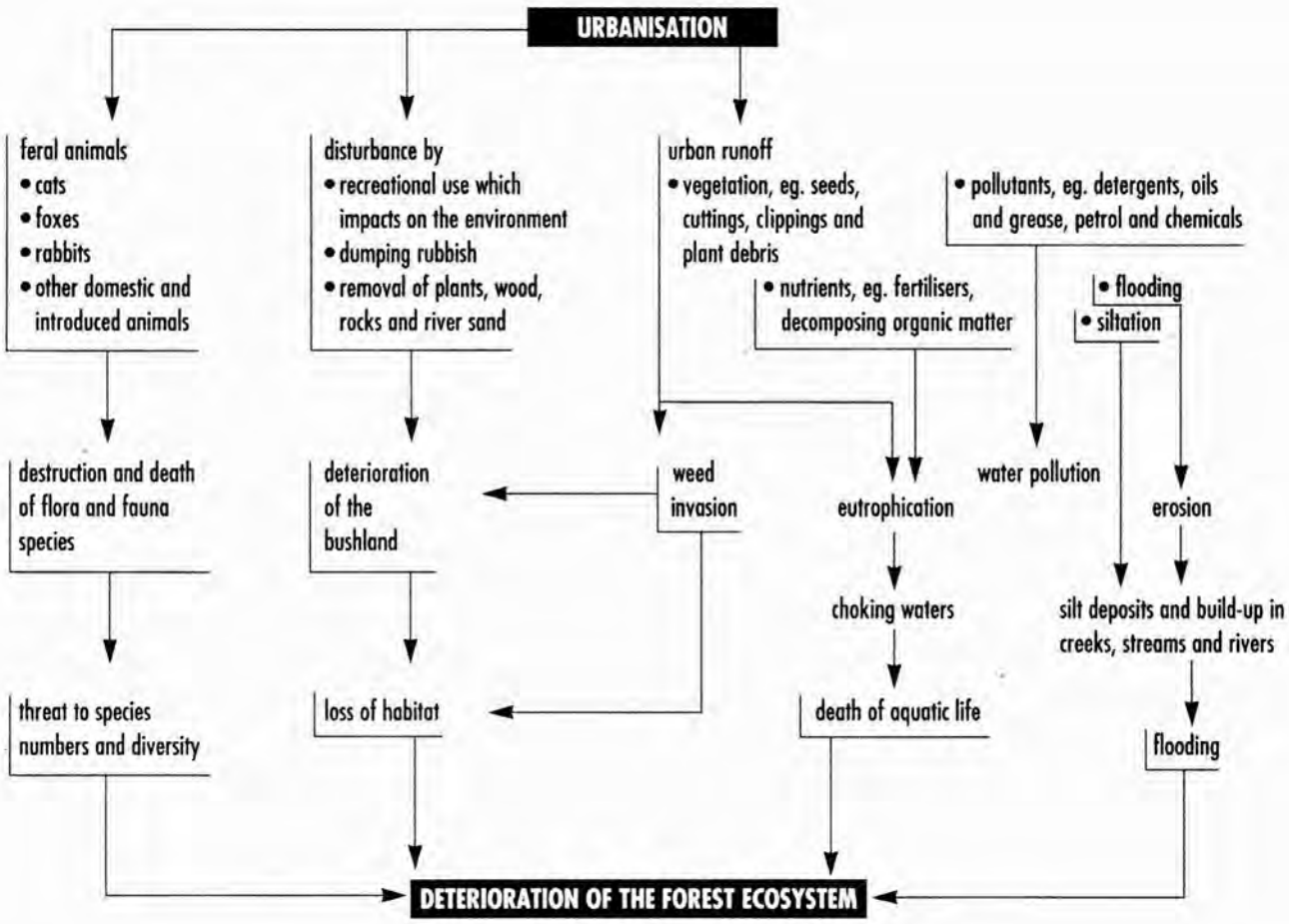


Clearing of land for development has resulted in increased weed infestation, such as blackberries, commonly seen throughout eastern New South Wales.

SUGGESTED ACTIVITIES

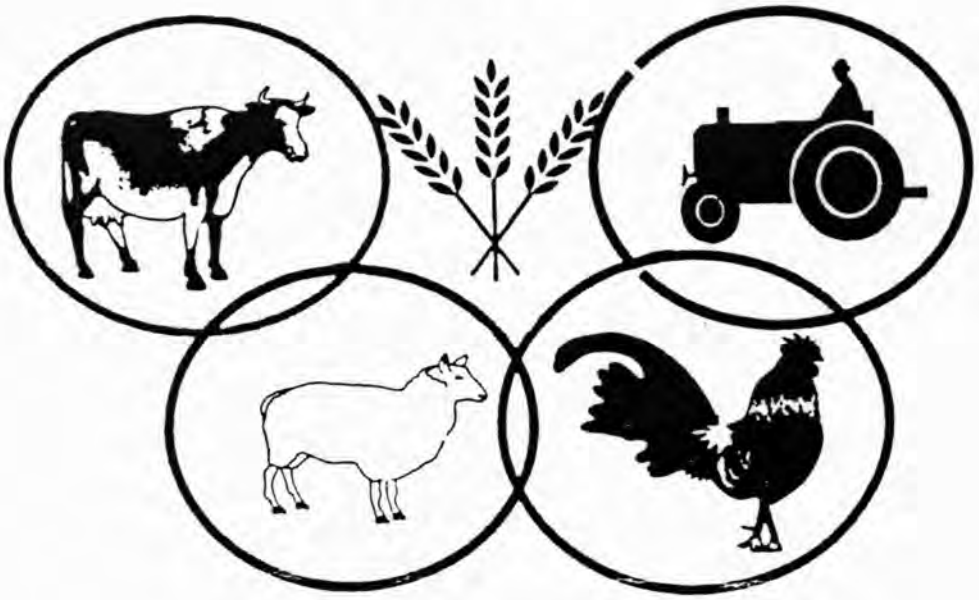
1. Revision Sheet 11.5.1.
2. Revision Sheet 11.5.2.

FIGURE 11.5.1 MAJOR URBAN THREATS TO STATE FORESTS AND BUSHLAND



PENRITH DISTRICT A.H. & I SOCIETY LTD

2002
ANNUAL PENRITH
SHOW



SCHOOLS AGRICULTURAL
COMPETITION

24TH & 25TH AUGUST

PHONE: (02) 4721 2375
FAX: (02) 4732 2763

SECTION 25 - SCHOOLS AGRICULTURAL COMPETITION

24th & 25th August 2002

It is proposed to have a compulsory "static" display to be entered by each participating school. Five other areas or entries are to be drawn from a possible (16) categories and awarded points after judging. This could include e.g. an animal exhibit - goat, a plant exhibit - vegetables. You may take samples from the static display and enter them in the individual exhibits.

This year the display will be one section. The other categories will be a separate section. Each School participating will receive part of $400 to be divided between Schools.

Categories will be -

1. Poultry - Soft feather Pair
2. Poultry - Hard feather Pair
3. Poultry - Waterfowl Pair
4. Sheep for Wool Coloured - any Gender
5. Sheep for Wool - White
6. Sheep Fat Lambs - Ewe
7. Sheep for Fat Lambs - Ram
8. Fat Lamb
9. Vegetables - Mixed Presentation Grown on School Farm
10. Preserves and Jams or Jellies - (2) Jars of any
11. Horticulture - Potted Plants, Group of (6) Native or Ornamentals
12. Cattle Beef Male Bull or Steer
13. Cattle Beef - Female
14. Cattle - Dairy
15. Goats - Dairy
16. Goats - For Fibre
17. Wool - Merino
18. Wool - Coloured
19. Fodder Collection - Dried, Bundles of Diameter 25-50 mm (5) Varieties
20. Fodder Collection - Fresh Cut (2) Varieties (6) Stalks of each
21. Honey - (3) Jars
22. Fibre from Goats
23. Apiary Display - Frame of Bees (2) Jars Honey, 2 x 500 g Blocks of Wax
24. Alternative Animal

Entries to be in by the end of June from schools wishing to compete.
A Perpetual Shield will be awarded.
If interested contact Gordon Moxon on (02) 4735 3701
or Geoff Clerk (02) 4735 1104 between 6pm & 9pm.
Overall Trophy for Best Exhibit - Dr Renshaw Memorial Cup

INFORMATION ABOUT EACH COMPETITION

1. **2002 CALF REARING COMPETITION** - Saturday Morning
- Sponsored by Emu Plain Correctional Centre

Calves will be graded on the morning of the Show into groups to be judged with one student leading each Calf. Each student must wear leather upper shoes or boots, a white lab coat, school tie & a hat of some type.

2. **CATTLE PARADERS** - Saturday Morning

Only two paraders per animal is possible to reduce stress. Entry on the morning.
Dress requirements: leather upper shoes or boots, white lab coat, school tie and hat of some type.

3. **WOOL JUDGING COMPETITION** - Saturday Afternoon

Four Merino Fleeces may include a comeback or Cross-Bred fleece. Entry on morning NO LIMIT.
The Judge reviews the Judging criteria and students compete Judging cards.

4. **SHEEP JUDGING COMPETITION** - Saturday Afternoon

Four sheep (Prime lambs or merino) to be judged on conformation. Entry on day with NO LIMIT.
The Judge reviews the criteria for Judging and students complete Judging cards.

5. **WALKING TRIAL** - either Saturday or Sunday

Students can enter in pairs to locate a list of items using clues provided.

PRIZE MONEY	**OTHER POINTS ALLOCATION**	
1st $ 100 Display & Other Categories	1st	4
2nd $ 80 Display & Other Categories	2nd	3
3rd $ 60 Display & Other Categories	3rd	2
4th $ 40 Display & Other Categories	4th	1

ALLOCATION OF POINTS PER COMPETITION	
Display	40 Points Maximum
Theme	30 Points Maximum
Identification	20 Points Maximum
Knowledge Of Display (Student Interview)	10 Points Maximum

COMPLETE AND FAX THE ENTRY FORM AS SOON AS POSSIBLE
Contact Gordon Moxon (02) 4735 3701 or Geoff Clerke (02) 4733 1204 Fax (02) 4733 1054

2002 PENRITH SHOW
SCHOOL AG COMPETITION

ENTRY FORM

To assist in planning the 2002 Penrith Show, please complete & fax this form to the Geoff Clerke on: (02) 4733 1054 as soon as possible.

NAME OF SCHOOL: .....

ADDRESS:.....

SCHOOL PH: ..... HOME PH: .....

FAX: .....TEACHER: .....

Complete the following:-
At this stage, our School is planning to enter the following. Selected categories can be changed next year.

1. Display Yes / No
2. Prison Farm Calf Yes / No
3. (5) Category Numbers (a) ___ (b) ___ (c) ___ (d) ___ (e) ___

Please circle the resources & indicate the number that your School would willing to provide for the Show use.

1. Merino Fleeces (no.)
2. Sheep of the Same Breed (no.)
3. Backpack for Spraying (no.)
4. Steel Fencing Posts (no.)
5. Calf Halters (no.)
6. Hair Driers (no.)
7. Other .....

Indication of areas of support. Please circle the competitions that you would be willing to have prime responsibility for. This would involve pre-show organising & the co-ordination on the day. Geoff will liaise with you.

1. Cattle Paraders Competition (Saturday Morning)
2. Sheep Judging (Saturday Afternoon with support from Kay Carter)
3. Wool Judging (Saturday Afternoon with support from Kay Carter)
4. Walking Trial

I would be willing to organise .....

PROGRAM 4

PRODUCT AND PROCESS CONTROL

More efficient rice handling and processing and the development of new rice-based products. Achieved through improvements in:

- Pre-milling quality
- Efficiency of milling
- Quality assurance and pest control
- By-products use
- New rice-based foods

PROGRAM 5

EDUCATION, SKILLS DEVELOPMENT AND TECHNOLOGY TRANSFER

This program aims to improve training, education and research opportunities to develop human resources to lead the Australian rice industry into the future. Education modules are being developed for:

- Farmer education and community awareness
- Extension and information technology methods
- Technological skills development
- Professional development at the graduate and postgraduate level

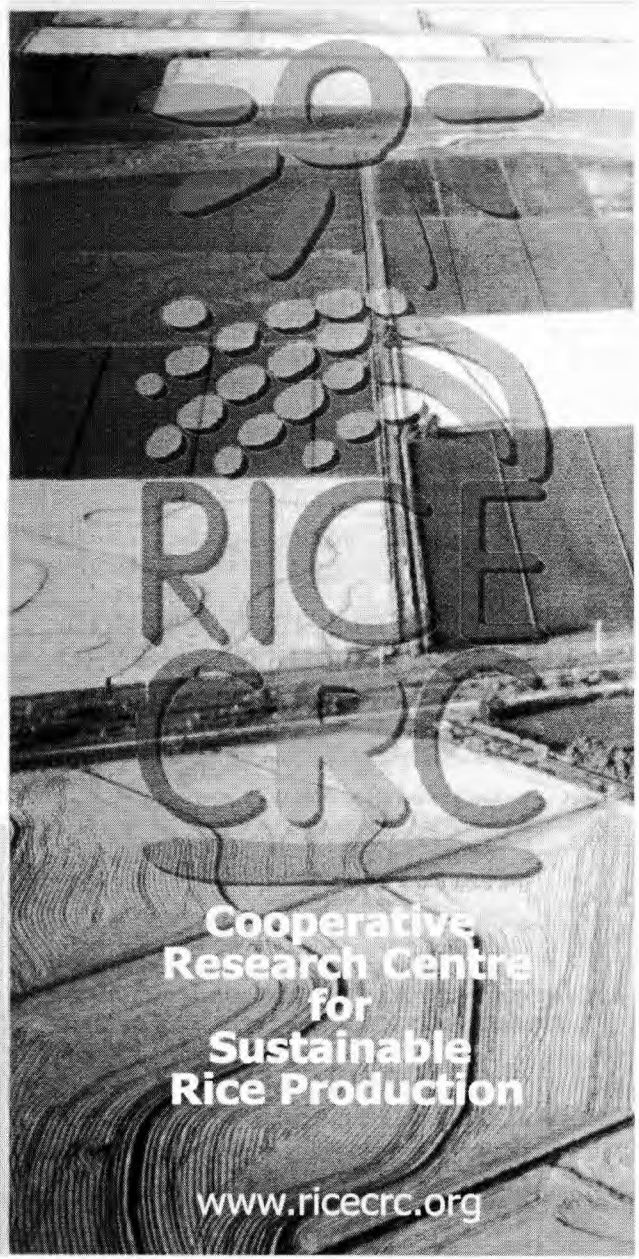
CONTACT

COOPERATIVE RESEARCH CENTRE FOR SUSTAINABLE RICE PRODUCTION

Rice CRC
c/- Yanco Agricultural Institute
Private Mail Bag
Yanco NSW 2703
Phone: 02 6951 2713
Fax: 02 6951 2533
Email: crc.rice@agric.nsw.gov.au
Web site: www.ricecrc.org

The Rice CRC is sponsored by the Australian Government's Cooperative Research Centres Program. The Centre coordinates the research activities of teams from Charles Sturt University, NSW Agriculture, CSIRO, Department of Land and Water Conservation, University of Sydney, Ricegrowers' Co-operative Ltd and the Rural Industries Research and Development Corporation.

CSIRO
RIRDC
RURAL INDUSTRIES RESEARCH & DEVELOPMENT CORPORATION
LAND & WATER CONSERVATION
CHARLES STURT UNIVERSITY
Ricegrowers
NSW Agriculture



THE RICE CRC

The Australian Rice Industry is largely based in the Murrumbidgee and Murray Valleys of NSW and is recognised as an efficient producer and exporter of high quality rice.

Production often exceeds one million tonnes from more than 120,000ha with at least 80% destined for export markets. The industry is recognised as a producer of high quality rice with attributes that satisfy diverse markets and which annually contributes more than $500 million to the Australian economy.

Total funding for the seven-year Rice CRC program is $53.02m. The Australian Government will provide $14.72m with $5.3m from other sources. In-kind contributions from the partners will be $33m.

The Rice CRC was formed to address specific issues to guarantee the long-term future of the rice industry. These include:

- Improved water use efficiency
- Minimising environmental impact of ricegrowing
- Maintaining competitiveness through improved production, processing efficiency and product quality
- Improving education standards throughout the industry.

The Rice CRC brings together key personnel to address these problems in five interrelated programs.

PROGRAM 1

SUSTAINABILITY OF NATURAL RESOURCES

This program aims to promote sustainability of the rice based cropping system by developing tools and techniques to improve the efficiency of natural resource use. It particularly aims to improve the management of water in the rice system.

Sub-Programs are:

- Better measurement and mapping
- Net recharge management
- Surface drainage management
- Groundwater management at the regional scale.

RICE CRC ON-LINE

The information technology expertise of Charles Sturt University and NSW Agriculture have combined to make **www.ricecrc.org** your gateway to rice industry research and education.
If you're involved in the rice or irrigation industries, you'll find **www.ricecrc.org** an invaluable information bank and reference source.





PROGRAM 2

SUSTAINABLE PRODUCTION SYSTEMS

To improve productivity of rice-based systems and minimise environmental impacts. Achieved through enhanced understanding of:

- The soil resource base
- Plant requirements for yield and quality
- Ecological weed and pest control

PROGRAM 3

GENETIC IMPROVEMENT FOR SUSTAINABLE PRODUCTION

Improving sustainability through better varieties. The effect will be:

- improved water use efficiency
  - higher yield
  - reduced duration
- Improved resistance to stress (particularly cold)
- Better plant breeding techniques
- Understanding chalkiness in rice

RICE CRC ... of growing importance

CRC AUSTRALIA

1 Rice Growing

RICE science

fact pack

micro innovation application TO MACRO

How rice is grown in Australia

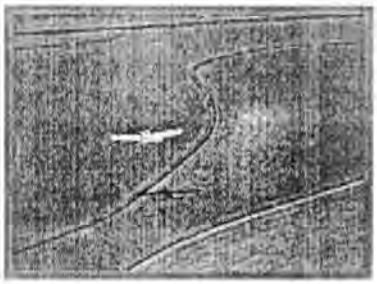
One rice crop is grown each year on irrigated farms in the Riverina area of NSW and the Murray Valley in Victoria.
Each year in Australia about 150,000 hectares ofrice are grown, producing from 1.2 - 1.7 million tonnes of paddy rice.

Sowing

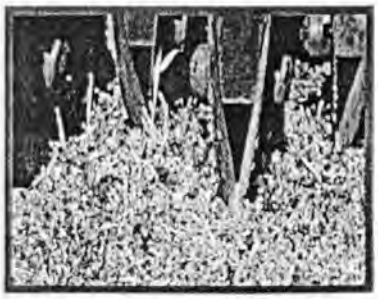
Rice is sown in October and November. The rice plants are grown under flooded conditions for most of the growing season, this is called ponding. The period of ponding varies from 110 to 140 days depending on the sowing method used, seasonal conditions, sowing time and the variety of rice being grown.

There are three ways rice is sown in Australia. Approximately 90% of the rice area is sown by aeroplane, the remaining area is sod seeded or combine sown using large tractors and specialised machinery.

Aerial sowing
The rice grains are pre-germinated by being soaked in water for 24 hours and then stacked to retain heat which causes the grains to sprout. They are then dropped from the aeroplane onto the flooded bays. The seed settles on the soft mud at the bottom of the bays and within 3-4 days the plant has a small, strong root and leaf system. After about 10 days small shoots emerge through the water. About 125kg of seed are flown onto each hectare of the rice field to produce a thick crop of rice.



Sod-seeding
Farmers use a tractor and triple disc seeding machine to plant the seed directly into pasture. The discs cut grooves in the soil and the seed is dropped in. The rice seed germinates after the paddock is watered. Once the rice seedlings are about 10cm tall, the farmer floods the bays and leaves the water on the paddock which drowns the remaining pasture plants, leaving the rice to grow.



Combine sowing
Rice seed is sown into cultivated (ploughed) soil using a tractor and combine. After sowing the bays are filled with water and drained within 24 hours to germinate the seeds. This is known as flushing and is repeated 2-3 times until the seedlings are about 10cm high. The permanent water then covers the soil until the crop matures.



Rice Growing

RICE

Harvesting

Rice is harvested from early March to May using machines called headers or harvesters. The farmer stops putting water on the crop when the grain starts to mature so that the ground will be dry enough for heavy machinery by harvest time.
Once the grain is harvested it is transported by trucks to rice storage sheds for drying. Rice is harvested at about 22% moisture and must be dried to 14% before it is stored or it will go mouldy.



Storage and milling

There are many paddy storage sheds throughout the rice growing area and these are located so farmers don't have to travel too far to deliver their rice.

There are four mills in the rice growing region at Leeton, Coleambally, Deniliquin and Echuca. Deniliquin is the largest mill in the southern hemisphere and one of the largest in the world.

There are also stockfeed mills in Leeton, Tongala and Cobden, a rice hulls by-product plant in Griffith and pet food factories in Leeton and Tongala.

In the first stage of milling, machines blow air through the paddy to remove dust, straw, empty hulls and other trash. The paddy is then passed between two rubber rollers to remove the hull, leaving brown rice.
The grains of brown rice pass through three lines of milling machines to rub off the bran layer, leaving white rice.
The rice is then sorted to remove any broken, immature or discoloured grains.
The remaining whole grain is packaged ready for sale.

Australian rice is of high quality and is sought after by overseas markets. Up to 85% of Australian rice is exported to more than 40 countries.
Papua New Guinea is the biggest buyer, buying 25% of what is exported. Other major markets include Japan, Hong Kong, Turkey, The Middle East, New Zealand, Fiji and the Solomon Islands.

Photos sourced from "The Story of Rice in Australia", Kondinin Group 2000

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fact pack
micro innovation application TOMACRO

fact pack

Better Selection

RICEscience

The challenge: to improve the natural resource base of riceland

The challenge facing researchers is to minimise the amound of water which moves underground in and around irrigation areas.
In irrgation areas can leak from rice bays, channels, drains and on-farm storages and moves through the soil at various depths from one location to another.
Finding ways to more accurately identify land from which water does not leak, or infiltrate, into the subsurface layers of the ground under flood irrigation conditions is a major objective of the Rice CRC.
This type of leakage is called groundwater accession. If groundwater accessions from irrigation land use can be reduced, then the environment and rice growers will be much better off.

- Production agriculture
  - Reduced rice water use in megalitres per hectare (ML/ha) terms
  - Increased rice water use efficiency (tonnes per ML) terms
- Environmental benefits
  - Reduced/reversed groundwater hydrograph trends
  - Less of the waterlogging and salinity which results from high groundwater levels
  - Reduced surface water salinity in irrigation areas and districts and, potentially, the areas beyond
  - Farm viability
  - increasedproductivity
  - higher profits
  - more prosperous families and communities

How is this done:

- EM instrument (Electromagnetic Induction) surveys.
  - EM instruments respond to soil texture, moisture content, salt and temperature (see next page)
- More widespread use of differential Global Positioning Systems (dGPS) for greater land survey accuracy
- Mapping packages
- Targeted soil investigations which compare soils with existing standards
- Better understanding of the relationship soil sodium levels and infiltration

Outcomes

- Adoption
  - Adoption of EM and targeted drilling approach by irrigation companies and Dept. Land & Water Conservation (DLWC) in areas servicing the rice industry
  - Uptake of new and improved technoloigies by private EM survey service providers
  - Introcution of standardised processes for ease of cross-checcking
- Identification
  - Removal from production of land that is unsuitable for rice growing following identification surveys by government agencies or individual growers
  - Identification of problems with channels, drains and storages
  - Possible flow-on effects to irrigation scheduling - improved site

innovation application TOMAGRO

fact pack

Better selection

RICESCIENCE

Reduced accessions to the watertable using EM technology



EM31 mounted on four-wheel motorbike

Electromagnetic induction technology using an EM31 has improved rice land assessment by being able to seperate what appears to be a uniform field or landscape on the surface, into areas which have different sub-surface features.

The EM31 measures the apparent electrical conductivity (ECa) of a soil to a depth of six metres from the surface.

Apparent electrical conductivity is primarily related to the salt, clay and moisture contents and bulk density of the soil. The ECa value is a potential indicator of soil permeability, in other words its ability to hold water.

The EM31 survey is usually conducted with the EM31 mounted on a four-wheel drive motor bike, operated along with a differential global positioning system (dGPS). Accurate geographical locations make it possible to map the rice field on the basis of ECa readings.

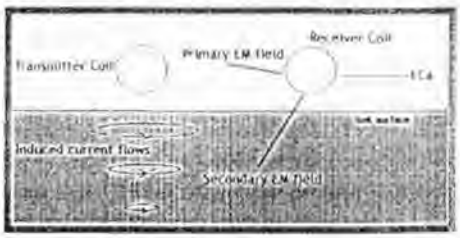


Rice soil suitability map of a rice field

EM31 survey used in conjunction with targeted soil profile sampling, provide a quick, objective and cost effective means of assessing potential soil permeability and the suitability of the land for ricegrowing. It is being used as an assessment technique prior to the development of new land for rice growing and determining where rice water use is unacceptable in problem rice fields.

The ability to identify the more permeable areas in a field using EM technology enables a high recharge area in a field to be taken out of rice production by redesigning field layout. Techniques such as puddling, compaction or clay sealing can also be used to reduce permeability.

About the EM31 instrument



The EM instrument gives fast readings of the electrical conductivity of the soil from which land can be classified for its suitability for rice growing. It transmits an alternating magnetic current into the soil. A secondary magnetic current is generated and detected by the instrument's receiver coil. The ratio between the greater and the smaller fields is the apparent electrical conductivity (ECa). This is sensitive to soil temperature, density, clay and water content and soil water salinity. Any one of these can be measured if the remaining soil properties are known or if a reliable estimate can made.

- Geoff Beecher and Brian Dunn, NSW Agriculture

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Chilling Out

RICEscience

fact pack

Innovation application TO MACRO

Less water leaves rice plants out in the cold

The Rice CRC is investigating a "flaw" in the rice plant's physiology that is a major barrier to the industy's efforts to make rapid advances in improving water use efficiency.

Rice plants are damaged by low temperatures during the critical pollen development stage in January-February. Temperatures below 15°C during this reproductive stage can result in a high proportion of sterile flowers and is the main limiting factor to grain yield.

Research has shown NSW rice yields are significantly reduced by cold in around 50% of years. Yields are reduced by more than 30% one year in 10. In 1996 alone, losses valued at $65 million at the farm gate resulted due to a cold-induced yield reduction of 25%.

Cold damage hinders the development of pollen grains, causing fertilisation to fail. Researchers have found that crops heavily dressed with nitrogen are more likely to be damaged by cold.

Until the riddle of rice plant cold sensitivity is solved, the industry will be limited in its ability to lower water usage, as flood irrigation acts like a "thermal blanket" over the crop, providing a level of protection for the plant. A more cold-tolerant rice plant would require less water for insulation against low temperature.

The Rice CRC cold damage research projects are designed to achieve:-

- Better understanding of the ability of the rice plant to respond to cold at the reproductive stage; and
- better soil nitrogen availability and plant uptake prediction methods aimed at maximising productivity while reducing application rates.

It is working to solve the cold tolerance/yield equation by:-

- improving yield efficiency by developing varieties with shorter growing seasons;
- improving tolerance to the stresses of cold; and
- improving breeding techniques.

Cellular biology of chilling-induced pollen damage in rice

The results of cold damage are only too familiar - even at the microscopic level. But while scientists and growers know only too well what cold damage looks like, we don't know why the symptoms occur. Why doesn't pollen develop and why is there breakdown in cellular tissue?

Researchers know that cold damage will one day be eradicated through the a application of gene technology. But exactly which gene will fix the problem?

The clues to this riddle are to be found locked away in the plant's reproductive cells. Rice CRC researchers have turned to the electron microscope to light a path through this minute maze of tissue and organic compounds. They've found that short exposure to mild chilling (12-15°C) causes the plant to abort the male (pollen) or female (ovary) tissues or both. This seems most likely to happen very early in pollen cell production.

By combining the techniques of electron microscopy and immunogold labelling, researchers have found evidence that the wall protecting the juvenile pollen cells breaks down earlier in cold-affected anthers. The pollen wall also fails to develop normally in chilled anthers, indicating that these events might be linked.

The movement of vital compounds inside the anther is being mapped so that comparisons between the transport pathways seen after chilling and those seen in anthers grown at normal temperatures can be made. The study of biochemical pathways within rice has also revealed some basic information about cell-to-cell communication in plant floral organs.

Researchers are continuing to tackle the two key questions: Is the chilling directly harming the cells before the microspore stage or is it actually retarding the functioning of the anther, or pollen bearing-structure, itself?

② Chilling Out

RICEscience

fact pack

Innovation - application TOMACRO

Molecular basis of cold-induced sterility in rice

Wide gaps in our knowledge of the physiology and molecular origins of the cold damage problem have hindered efforts to select cold-tolerant rice varieties using traditional plant breeding.
The Rice CRC is using molecular biology techniques to identify which genes are affected by cold conditions. The genes in the rice anther, which produce the enzyme invertase, are of particular interest to researchers.
Cold damaged pollen cells can be likened to deflated balloons. They fail to fill with the starch that provides the energy required for reproduction. Invertase is known to be a driver in the conversion of complex sugars like sucrose to simple ones like glucose, and is suspected of playing a part in the "starch ransfer blockage".
The Rice CRC is working to identify the effect of cold on the way sugars are manufactured and converted in rice anthers and the effect of cold on the genes in the rice anther which produce the enzyme invertase.
Researchers have found that changes in sugar levels happen very early in the sequence of biochemical change in cold-stressed rice anthers. Through improved understanding of invertase gene activity they are now well placed to identify cold-induced changes in sugar "downloading" to pollen. This will help identify whether cold-induced changes in sugar metabolism are caused by or result from pollen sterility.
The Rice CRC's work will lead to the design of strategies to develop cold-tolerant rice varieties either by genetic technology or molecular marker assisted breeding.

Cold tolerance at the plant level

Currently, increasing the depth of the water (20cm) is the major management strategy used by growers to protect their rice crops from low temperature damage during the reproductive stage. Water temperature can be up to 7°C warmer than air temperature.
The Rice CRC is investigating the responses of different rice varieties to low temperatures during the flowering phase in both glasshouse and field experiments. These experiments are carried out to assess the susceptibility/tolerance for varieties of different origins.
Field trials are sown with a single row planter on dates between mid-October and late December to maximise the chances of capturing low temperature events. At flowering, spikelets are collected and stored for measurement of anther size, pollen grains, stigma size and pollen interception by the stigma. An image analysis system, which includes a video connected to a microscope and then to a computer, produces images of pollen, anthers and stigmas which are then accurately measured using a software program.
These experiments have identified several varietes as more cold tolerant than the current Australian cultivars, these include the Hungarian cultivar HSC 55, Plovdiv 22 from Bulgaria, the American M103, Liman from Russia and Hitomebore from Japan. In the 2001/02 season replicated field trials tested 50 different cultivars, including Australian and international varieties at four sowing times.
In a first for Australian research, cold water from shallow aquifers was used to identify cold tolerant cultivars. A trial located on a property near the Yanco Agricultural Institute has been used successfully for identifying the level of cold tolerance of seven cultivars. In the 2001/02 season 24 Australian and international cultivars were tested in a larger cold water system.

The information contained in this Research Brief is based on knowledge and understanding at the time of writing (19 October, 2001). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of Cooperative research centre for Sustainable Rice Production or the user's independent adviser.

1 Natural Resource Management

RICE science

fact pack

Innovation application micro TO MACRO

Background

Rice CRC groundwater research is helping Murrumbidgee, Murray and Coleambally irrigation improve land and water management actions and educate farming communities in water efficiency and groundwater management issues. Geographical Information Systems (GIS) and modelling tools have been developed to help understand why and how salt moves through the landscape and to predict the behaviour of watertables and salinity under changing climatic and management influences.

Among the outputs and outcomes of the Rice CRC environmental research are:

- Hydrogeological (GIS) databases of the three irrigation areas
- A water and salt water balance model aimed at understanding on-farm and regional management options for the Coleambally Irrigation Area (CIA) and Murrumbidgee Irrigation Area (MIA)
- Development of a farm-scale hydrologic economic model - SWAGMAN Farm - which can be used to understand environmental and economic trade-offs of different cropping and management options
- Statistical tools to understand variability of rainfall and its impacts on watertables

Outcomes

Hydrogeological studies in the CIA have identified five groundwater management zones with distinctly different groundwater dynamics. As a result, Coleambally Irrigation Cooperative Ltd (CICL) has restructured the delivery of its Land and Water Management Plan to maximise interaction, understanding and information sharing between environmental staff and irrigators within each of these zones.

The company plans to base its future pumping strategies, incentives and policies on the findings of this work and similar studies and educational programs are commencing in the Murrumbidgee and Murray Irrigation Areas.

The SWAGMAN Farm model is an important educational tool, helping individual farmers understand the impacts of different land uses on watertables, root zone salinity and gross margins and identify more sustainable but profitable options. CICL environmental officers have been trained in its use as well as the interpretation of hydrogeological studies to explore land and water management options with farmers.

Scores of farmers and a number of natural resource managers have been trained in net recharge management, including hands-on use of the SWAGMAN Farm model. Results from SWAGMAN Farm modelling have been compared with watertable changes in the Coleambally and Murray regions and have gained the confidence of farmers and irrigation area managers.

The CIA groundwater model has been used investigate appropriate deep and shallow bore pumping strategies. This will enable maximum shallow watertable and salinity control while providing additional water for irrigation.

- Dr Shahbaz Khan, CSIRO Land & Water

② World First for Riverina Researchers

RICE science

fact pack

micro to macro innovation application

Australia pilots world toward more sustainable future

When the nations of the world went looking for help in tackling the multiple environmental and social challenges of water resource management they found it on the driest habitable continent on the planet.

A catchment-based cooperative research and education project operating in the lower Murrumbidgee region in south-west New South Wales has been listed as the world's first HELP pilot basin by the United Nations Educational Scientific and Cultural Organisation (UNESCO).

In a unique example of collaboration, the CSIRO Land and Water and the Rice CRC have brought together scientists, government and the community to devise and implement practical solutions to complex problems.

They have tapped one of the world's richest reserves of hydrological, geological and climate information to develop educational and analytical tools that are empowering natural resource managers and individual landholders as they push for a sustainable and profitable future.

UNESCO and its partner in the initiative, the World Meteorological Organization (WMO), describe HELP - Hydrology for the Environment, Life and Policy - as real people working in real catchments to deliver real answers.

"The whole process has been about building capacity at various levels," said CSIRO Land and Water senior research scientist Dr Shahbaz Khan, who is credited with building the groundbreaking network.

The capacity to which Dr Khan refers is based on CSIRO's constantly evolving Salt WAter and Groundwater MANagement (SWAGMAN) modelling system, priceless historical data sets and vital seed funding provided by the Rice CRC

"It really is all about organisations and individuals talking to each other to address the demand for solutions."

Dozens of agency representatives, along with scores of farmers are using the tools for positive change on local and regional scales. Hundreds of landholders are set to come on line.

Their collective knowledge and experience is already being exported to catchments in China, India and South Africa.

"The lower Murrumbidgee network is dealing with multiple and interrelated problems and conflicts," Dr Khan said.

They include rising watertables and salinity; reduced river flows; legislative reforms; competition between water users, including the environment; and falling deep aquifer pressure levels.

Little wonder UNESCO and WMO chose the Murrumbidgee group as the their standard bearer.

"HELP is a problem-driven and demand-responsive initiative which will support improvements in integrated catchment management on a global scale," said UNESCO's Dr Mike Bonell.

"I am really delighted that Australia offers the first global Reference Basin although from my personal perspective the outcome was never in doubt."

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Southern Bell Frog

RICEscience

fact pack

Innovation application MACRO

Background

The Southern Bell Frog (*Litoria raniformis*) is one of a number of amphibian species worldwide that under went declines after the 1980's. It is listed as endangered ENB2ab(iii) in the IUCN red data book, nationally it is listed as threatened and in NSW it is listed as endangered. It is one of the most poorly researched and understood amphibian species in Australia. There has been no research to identify the cause(s) of population declines or to identify the aspects of the species' ecology and biology that make it vulnerable to population collapses.

Rice growing areas, especially Coleambally and Lowbidgee support NSW's, if not Australia's most important Southern Bell Frog populations. The preservation of the Southern Bell Frog in rice growing areas is of particular importance for regional biodiversity and also for the long-term persistence of the species.



Research

Our research is focused on identifying how the Southern Bell Frog utilises irrigation areas:

- Use of habitat types over range and over time;
- Population biology;
- Population spread; and
- Identification of potential threatening processes such as evidence of Chytrid infection amongst populations

It is highly likely that the Southern Bell Frog is breeding in rice bays and possibly using canals and permanent dams throughout spring and autumn. We suspect they are over wintering in woodland remnants.



Environmental outcomes

The key outcome of this project is to increase our knowledge of the Southern Bell Frog so we can plan and implement scientifically rigorous and effective conservation strategies to ensure its persistence in both irrigation and non-irrigation areas where it occurs. It will also allow us to better plan for biodiversity management and restoration programs.

- Skye Wassens, Charles Sturt University

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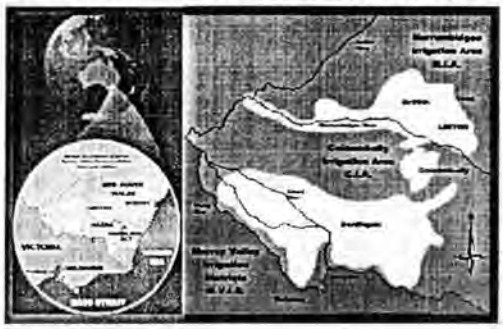
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innovation application micro TO MACRO

① Riceland Fauna

RICEscience

Wildlife of the Riverina Ricegrowing Region



MAMMALS

Black Rat
Brown Hare
Cat - domesticated & feral
Cattle - domesticated & feral
Common Brush Tail Possum
Common Ringtail Possum
Dogs - domesticated & feral
Eastern grey Kangaroo
Fat Tailed Dunnart
Feather Tail Glider
Fox - feral
Goat - domesticated & feral
Gould's Long Eared Bat
Gould's Wattled Bat
Greater Long Eared Bat
House Mouse
Koala
Large Footed Mouse
Eared Sugar Glider (above)
Bat
Lesser Long Eared Bat
Little Broad nosed Bat
Little Forest Eptesicus
Little Mastiff Bat
Little Red Flying Fox
Pig - domesticated & feral
Platypus
Rabbit
Red Kangaroo
Sheep - domesticated
Short Beaked Echidna
Sugar Glider
Swamp Wallaby
Tiger Quoll
Water Rat
Western Broad Nosed Bat
Western grey Kangaroo
White Striped Mastiff Bat
Yellow Footed Antechinus

BIRD SPECIES

NOCTURNAL BIRDS OF PREY
Australian Owlet Nightjar
Spotted Nightjar
Tawny Frogmouth
OWLS
Barking Owl
Barn Owl
Masked Owl
Southern Boobook
FLIGHTLESS BIRDS
Emu
GROUND DWELLING FOWLS
Brown Quail
Stubble Quail
BUTTON QUAILS
Little Button Quail
Painted Button Quail
Red Chested Button Quail
WATERFOWL
Australasian Shoveler
Australian Shelduck
Australian Wood Duck Black Swan
Blue Billed Duck
Cape Barron Goose
Chestnut Teal
Freckled Duck
Grey Teal
Hardhead
Magpie Goose
Musk Duck
Pacific Black Duck
Pink Eared Duck
Plumed whistling duck
Wandering Whistling Duck
DIVING WATERBIRDS
Australasian Grebe
Great Crested Grebe
Hoary Headed Grebe
BIRDS WITH FISHING BEAKS
Australian Pelican
Darter
Great Cormorant
Little Black Cormorant
Little Pied Cormorant
Pied Cormorant
WADING BIRDS
Australasian Bittern
Australian White Ibis
Cattle Egret
Glossy Ibis
Great Egret
Intermediate Egret
Little Bittern
Little Egret
Nankeen Night Heron
Royal Spoonbill
Straw Necked Ibis
White Faced Heron
White Necked Heron
Yellow Billed Spoon Bill
BIRDS OF PREY
Australian Hobby
Black Falcon
Black Kite
Black Shouldered Kite
Brown Falcon
Brown Goshawk
Collared Sparrowhawk
GreyFalcon
Grey Goshawk
Letter Winged Kite
Little Eagle
Nankeen Kestrel
Peregrine Falcon
Spotted Harrier
Square Tailed Kite
Swamp Harrier
Wedge Tailed Eagle
Whistling Kite
White Bellied Sea Eagle
CAVITY NESTING BIRDS
Azure Kingfisher
Dollarbird
Kookaburra
Rainbow Bee Eater
Red Backed Kingfisher
Sacred Kingfisher
PARROTS
Blue Bonnet
Blue Winged Parrot
Budgerigar
Cockatiel
Crimson Rosella
Eastern Rosella
Galah
Glossy Black Cockatoo
Little Corella
Little Lorikeet
Long Billed Corella
Major Mitchell Cockatoo
Mulga Parrot
Red Rumped Parrot
Sulphur Crested Cockatoo
Superb Parrot
Swift Parrot
Turquoise Parrot
Yellow Rosella
MIGRATORY WATERBIRDS
Australian Pratincole
Banded Lapwing
Banded Stilt
Bartailed Godwit
Black Fronted Dotterel
Black Winged Stilt
Blacktailed Godwit
Bush Stone Curlew
Caspian Tern
Common Greenshank
Common Sandpiper
Cox's Sandpiper
Curlew Sandpipers

2

Riceland Fauna

RICEscience

fact pack

Double Banded Plover
Great Knot
Grey Plover Gull Billed Tern
Inland Dotterel
Latham's Snipe
Little Curlew Little Stint
Long Toed Stint
Marsh Sandpiper
Masked Lapwing
Pacific Golden Plover
Painted Snipe
Pectoral Sandpiper
Plains Wanderer
Red Capped Plover
Red Kneed Dotterel
Red Knot
Red Necked Avocet
Red Necked Stint
Ruddy Turnstone
Ruff
Sharp Tailed Sandpiper
Silver Gulls
Whiskered Tern
White Rumped Sandpiper
White Winged Black Tern
Wilson's Phalarope
Wood Sandpiper

GROUND DWELLING BIRDS

Australian Bustard
Australian Spotted Crake
Baillon's Crake
Black Tailed Native Hen
Brolga
Buff Banded Rail
Dusky moorhen
Eurasian Coot
Purple Swamphen
Spotless Crake

DOVES & PIGEONS

Bar Shouldered Dove
Common Bronzewing
Crested Pigeon
Diamond Dove
Peaceful Dove
Rock Dove

PERCHING SONGBIRDS

Apostle Bird
Australian Magpie
Australian Raven
Black Chinned Honeyeater
Black Faced Cuckoo Shrike
Black Faced Wood Swallow
Black Honey Eater
Blue Faced Honey Eater
Brown Headed Honeyeater
Brown Songlark
Brown Thornbill
Brown Treecreeper
Buff Rumped Thornbill
Chestnut Quail Thrush
Chestnut Rumped Thornbill
Clamorous Reed Warbler
Common Blackbird
Common Starling
Crested Bellbird
Crested Shrike Tit
Crimson Chat
Diamond Firetail
Double Barred Finch
Dusky Wood Swallow
Eastern Yellow Robin
Eurasian Blackbird
Eurasian Tree Sparrow
European Goldfinch
Fairy Martin
Flame Robin
Fuscous Honey Eater
Gilbert's Whistler
Golden Headed Cisticola
Golden Whistler
Grey Butcherbird
Grey Crowned Babbler
Grey Fantail
Grey Fronted Honeyeater
Grey Shrike Thrush
Ground Cuckoo Shrike
Hooded Robin
House Sparrow
Inland Thornbill
Jacky Winter
Leaden Flycatcher
Little Friar Bird
Little Grassbird
Little Raven
Magpie Lark
Mallee Ring Neck
Masked Woodswallow
Mistletoe Bird
Noisy Friarbird
Noisy Miner
Olive Backed Oriole
Orange Chat
Painted Honey Eater
Pied Butcherbird
Pied Currawong
Pied Honey Eater
Red Browed Finch
Red Capped Robin
Red Wattle Bird
Regent Honey Eater Restless Flycatcher
Richards Pipit
Rufous Songlark
Rufous Whistler
Satin Fly Catcher
Scarlet Robin
Shy Heath Wren
Silver Eye
Singing Honeyeater
Singing Bushlark
Skylark
Southern Whiteface
Speckled Warbler
Splendid Fairy Wren
Spiny Cheeked Honeyeater
Spotted Pardalote
Striated Pardalote
Striated Thornbill
Striped Honeyeater
Southern Scrub Robin
Superb Fairy Wren
Tree Martin
Varied Sittella
Variegated Fairy Wren
Weebill
Welcome Swallow
Western Gerygone
White Backed Swallow
White Bellied Cuckoo-Shrike
White Breasted Wood Swallow
White Browed Babbler
White Browed Wood Swallow
White Browed Scrub Wren
White Eared Honeyeater
White Fronted Chat
White Fronted Honey Eater
White Naped Honey Eater
White Plumed Honey Eater
White Throated Gerygone
White Throated Tree Creeper
White Winged Chough
White Winged Fairy Wren
White Winged Triller
Willie Wag Tail
Yellow Faced Honey Eater
Yellow Plumed Honey Eater
Yellow Rumped Pardalote
Yellow Rumped Thornbill
Yellow Thornbill
Yellow Tufted Honeyeater
White Rumped Miner

HUMMING BIRDS

Fork Tailed Swift
White Throated Needletail

CUCKOOS

Black Eared Cuckoo
Fan Tailed Cuckoo
Horsfields Bronze Cuckoo
Pallid Cuckoo
Shining Bronze Cuckoo

REPTILES

Bandy Bandy
Bearded Dragon (above)
Boulenger's Skink
Broad Shelled River Turtle
Broad Banded Sand Swimmer
Burton's Legless Lizard
Carnaby's Wall Skink
Carpet Python
Common Scaly foot
Curl Snake
Diamond Python
Eastern Blue Tongued Lizard
Eastern brown Snake
Eastern Long Necked Tortoise
Eastern Spiny Tailed Gecko
Eastern Tiger Snake
Garden Skink
Gould's Goanna
Grey's Skink
Grey Snake
Hooded Scaly Foot
Lace Monitor
Lined Earless Dragon
Mallee Dragon
Marbled Gecko
Mulga Snake
Blue Tounged Lizard
Murray Turtle
Nobbi
Olive Legless Lizard
Painted dragon
Red Bellied Black Snake
Red Throated Skink
Shingleback
Stone Gecko
Striped Skink
Tawny Dragon
Tessellated Gecko
Thick Tailed Gecko
Tree Dtella
Tree Skink
Western Blue Tongued Lizard
Western Brown Snake
Yellow Faced Whip Snake

AMPHIBIANS

Brown Toadlet
Common Eastern Froglet
Painted Burrowing Frog
Crucifix Frog
Desert Tree Frog
Eastern Banjo Frog
Giant banjo Frog
Barking Marsh Frog
Peron's Tree Frog
Plains Froglet
Salmon Striped Frog
Sloane's Toadlet
Southern Bell Frog
Spotted Grass Frog
Water Holding Frog

AQUATIC LIFE

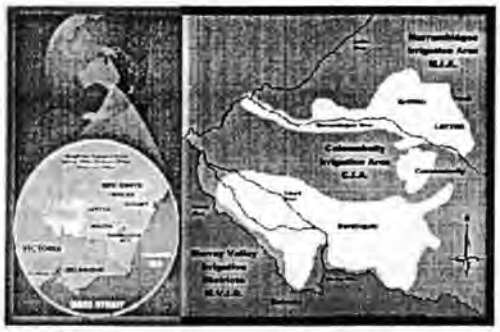
Australian smelt
Bony bream
Common carp
Freshwater catfish
Freshwater mussels
Golden perch
Goldfish
Mosquito fish
Murray cod
Pigmy perch
Rainbow fish
Hardyhead
Redfin
Silver perch
Tench
Yabbie

micro fact pack ① innovation application TO MACRO

Riceland Flora

RICEscience

Vegetation in the Riverina Ricegrowing Region



Plant Species

African boxthorn
Annual beardgrass
Annual bluebell
Annual cat's tail
Annual velt grass
Apple sundew
Apricot
Ascending sunray
Asparagus
Australian bear's-ear
Australian bindweed
Australian bluebell
Australian bugle
Australian carrot
Australian carrot
Australian cranesbill
Australian hollyhock
Australian mudwort
Australian piert
Australian stonecrop
Autumn greenhood
Awnless barnyard grass
Barley grass
Barnyard grass
Barrel medic
Bastard fumitory
Bathurst burr
Bearded oat
Beauty buttons
Bimble box
Bindi-eye
Bird's-foot trefoil
Bird rape
Bishop's weed
Black box
Black cottonbush
Black cypress pine
Black roly-poly
Black-berry nightshade
Bladder ketmia
Bladder saltbush
Blanket fern
Blown grass
Blue crowfoot
Blue fingers
Blue periwinkle
Bluebell
Bogan flea
Bokhara clover
Boree
Box grass
Box mistletoe
Box-leaf wattle
Branched centaury
Broad-leaf hopbush
Broad-leaf millotia
Broughton pea (above)
Brown's lovegrass
Brown back wallaby grass
Brown beetle grass
Brush wiregrass
Buckbush
Bulbous bluegrass
Bull oak Burr medic
Bushy groundsel
Bushy starwort
Butterbush
Buttercup
Camel melon
Capeweed
Cat-head
Caustic weed
Celery buttercup
Chickweed
Chicory
Cleavers
Climbing saltbush
Clover
Clustered clover
Clustered copper-wire daisy
Clustered dock
Clustered everlasting daisy
Coarse club rush
Common bartsia
Common billy buttons
Common bitter-cross
Common buttercup
Common cotula
Common cranesbill
Common crowfoot
Common duckweed
Common evening primrose
Common fringe-myrtle
Common heliotrope
Common nardoo
Common onion orchid
Common pigweed
Common reed
Common rush
Common sneezeweed
Common spike rush
Common sunray
Common verbena
Common vetch
Common water milfoil
Common wheatgrass
Common wiregrass
Common woodruff
Cooba
Coolah grass
Corkscrew grass
Corn gromwell
Corrugated sida
Corrugated sida
Cotton bush
Cotton fireweed
Cotton panic grass
Couch grassCough-bush
Creamy candles
Creeping cudweed
Creeping knotweed
Creeping saltbush
Cretan weed
Cumbungi
Curled dock
Curley brome
Curley windmill grass
Curly pondweed
Dandelion
Deanne's wattle
Dense stonecrop
Devil's rope
Dirty Dora
Dock
Downy darling pea
Drooping lovegrass
Drooping she-oak
Duckweed
Dwarf daisy
Dwarf greenhood
Dwarf jo-jo
Dwarf skillcap
Dwarf sunray
Dwyer's mallee gum
Early Nancy
Early spring grass
Eastern cottonbush
Emubush
Erect guinea-flower
Fairy grass
False hairgrass
Fat-hen
Fennel
Fern-leaf hopbush
Ferny buttercup
Ferny cotula
Fine sida
Fine-leaf tussock grass
Finger rush
Flannel cudweed
Flatweed
Flax-leaf fleabane
Flecked flat sedge
Floating pondweed
Four-leaf allseed
Fox-tail fescue
Foxtail speargrass
French catchfly
Fuzzweed
Gargaloo
Giant sedge
Golden everlasting
Golden-top
Gorse bitter-pea
Grass cushions
Great brome soft brome
Grey germander
Green spider orchid
Grey box
Grey mistletoe
Grey raspwort
Grey sunray
Grey wattle
Grooved dampiera
Hairgrass
Hairy carpet-weed
Hairy centrolepis
Hairy fiddleneck
Hairy joyweed
Hairy panic
Hairy stylewort
Hairy-pod cress
Hairy-tails
Hard-headed daisy
Hare's tail
Haresfoot clover
Harlequin mistletoe
Hedge mustard
Hexham scent
High sida
Hill indigo
Hill raspwort
Hill wallaby grass
Hoary sunray
Hoary willowherb
Hooked cudweed
Hop clover
Hop goodenia
Horehound
Hyssop loosestrife
Inland wonga vine
Japanese cudweed
Jerry-Jerry
Jersey cudweed
Jo-jo
Johnson grass
Kangaroo grass
Kangaroo thorn
Khaki-weed
Kidneyweed
Knob sedge
Kurrajong
Lagoon saltbush
Large mudwort
Leek lily
Leopard orchid
Lesser canary grass
Lesser joyweed
Lignum
Lobed wallaby grass
London rocket
Long storksbill
Long-leaf waxflower
Long-style feather grass



fact pack

innovation application TOMACRO

Lucerne
Madeira winter cherry
Mallee goosefoot
Maltese cockspur
Many-flowered mat-rush
Marsh foxtail
Marsh watercress
Meadow rice-grass
Mediterranean barley grass
Midget greenhood
Miljee
Minnie daisy
Moonah
Mouse-ear chickweed
Mulga fern
Mulga grass
Narrow-leaf clover
Narrow-leaf vetch
Native blackthorn
Native cherry
Native leek
Native liquorice
Native millet
Needlewood
Nettle-leaf goosefoot
Niggerheads
Nitre goosefoot
No.9 wiregrass
Nodding blue lily
Nodding chocolate lily
Nodding clover
Noogoora burr
Old man salt bush
Olive
Onion grass
Orange sunray
Ox-tongue
Paddy melon
Pale goodenia
Pale knotweed
Pale pigeon grass
Paradoxa grass
Paspalum
Patterson's curse
Penny royal
Pepper tree
Peppercress
Perennial marsh cress
Perennial ryegrass
Perennial velt grass
Persian speedwell
Petty spurge
Phalaris
Pigmy sunray
Pimpernel
Pin sida
Plains grass
Poison pratia
Poverty weed
Prairie grass
Pretty cryptandra
Prickly lettuce
Prickly sowthistle
Punty bush
Purple burr daisy
Purple lovegrass
Purple mintbush
Purple parsnip
Purple-flowered devil's-claw
Purple-top
Pussy-tails
Quena
Quick grass Quillwort
Rat's-tail fescue
Red azolla
Red brome
Red clover
Red-flowered mallow
Ribbed spike rush
Ribwort
Ridge sida
Rigid panic
Rigid ryegrass
River minth
River red gum
Riveroad
Rock fern
Rough bedstraw
Rough burr-daisy
Rough fuzzweed
Rough poppy
Rough raspwort
Rough speargrass
Ruby saltbush
Rusty spider-flower
Saffron thistle
Saloop
Salsify
Sand brome
Sandspurrey
Scarlet sundew
Scorzonera
Scotch thistle
Scrambled eggs
Scrub nettle
Sea barley
Seablite
Serrated goodenia
Sharp buttercup
Sheep's burr
Shepherd's purse
Shivery grass
Short fruit nardoo
Showy isotome
Shrubby platysace
Silky brome
Silky goodenia
Silky guinea-flower
Silvery hairgrass
Skeleton weed
Slender dock
Slender knotweed
Slender panic
Slender riceflower
Slender speargrass
Slender sun orchid
Slender thistle
Slender violet
Small bedstraw
Small crumbweed
Small flowered wallaby grass
Small hairy daisy
Small nettle
Small purslane
Small snadspurrey
Small St John's wort
Small vanilla lily
Small woolly burr medic
Small-flowered buttercup
Small-flowered goodenia
Small-flowered mallow
Small-leaf goosefoot
Small-leaf waxflower
Smilax asparagus
Smooth catsear
Smooth centrolepis
Smooth flax lily
Smooth goodenia
Smooth nettle
Smooth sunray
Snowy mintbush
Soft lovegrass
Soursob
Spear thistle
Speargrass
Spiked cudweed
Spiny burr grass
Spiny-fruit saltbush
Sponge-fruit
Spoon cudweed
Spreading flax lily
Spreading goodenia
Spreading sneezeweed
Spreading stonecrop
Spreading umbrella grass
Square cicienda
Squirrel-tail fescue
Stagger-weed
Star copperburr
Star thistle
Starwort
Sterile brome
Sticky everlasting
Stink grass
Stinking hawksbeard
Stinking pennywort
Stinkwort
Strawberry clover
Subterranean clover
Summer grass
Swamp buttercup
Swamp lily
Sweet briar
Tall bluebell
Tall cupgrass
Tall fleabane
Tall groundsel
Tall sedge
Tall spike rush
Tall sundew
Tar vine
Thick-fruited buttercup
Thread iris
Thyme spurge
Timothy grass
Tiny duckweed
Tiny pennywort
Tiny star
Toad rush
Trailing verbena
Tree Lucerne
Tufted bluebell
Tufted burr-daisy
Turnip weed
Tussock grass
Tussock rush
Twiggy daisy-bush
Twiggy mullein
Twining glycine
Twining toadflax
Umbrella sedge
Urn heath
Variable glycine
Variable plantain
Variable sword sedge
Variegated thistle
Velvet pink
Velvet wallaby grass
Wall fumitory
Wallaby grass
Wandering speedwell
Warrego summergrass
Water couch
Water primrose
Water ribbons
Waterbuttons
Waterwort
Wattle mat-rush
Wedge-leaf hopbush
Weeping lovegrass
Weeping willow
Western black wattle
White cedar
White clover
White cypress pine
White top
White-flowered fumitory
Wilcannia lily
Wild flax
Wild lettuce
Wild oat red leg grass
Wild radish
Wild sage
Wild turnip
Wimmera ryegrass
Windmill grass
Winged slender thistle
Wingless fissure-weed
Winter grass
Wireweed
Wiry dock
Wiry mitrewort
Wood sorrel
Woolly buttons
Woolly clover
Woolly heads
Woolly mantle
Yabila grass
Yanga bush
Yanganbil
Yellow box
Yellow burr daisy
Yellow centaury
Yellow rush lily
Yellow suckling clover
Yellow twin-heads

micro ✓ innovation ✓ application TO MACRO

fact pack

Water Quality

CSIRO

RICEscience

OUTCOME
Enable farmers to formulate a best management plan for application and control of pesticides on their property

OUTCOME
Provide irrigation companies with a predictive tool for maintaining and managing drainage water quality

AUSTRALIAN PLANTS SOCIETY

District Group Directory

District Group	Meets At
Armidale & Districts	Armidale
Blue Mountains	Glenbrook
Central Coast	Narara
Central West	Various Locations
Coffs Harbour	Coffs Harbour
East Hills	Peakhurst
Far North Coast	East Lismore
Glen Innes	Glen Innes
Harbourside	Lane Cove
Hawkesbury	North Richmond
Hunter Valley	Maitland
Illawarra	Corrimal
Inner Sydney	Sydney
Macarthur	Mt Annan
Menai	Illawong
Mid North Coast	Port Macquarie
Newcastle	Shortland
North Shore	Hornsby
Nowra	Nowra
Parramatta-The Hills	Baulkham Hills
St George	Carlton
South East Coast	Various Locations
Southern Highlands	Various Locations
Southern Tablelands	Goulburn
South West Slopes	Cootamundra
Sutherland	Gymea
Tamworth	Various Locations
Wagga Wagga	Wagga Wagga
Warringah	Dee Why

District Groups are being formed in other areas; contact the Membership Officer for information

MOUNT ANNAN BOTANIC GARDEN

Mount Annan Drive, Mount Annan

Mount Annan is the native plant garden of the Royal Botanic Gardens Sydney and at 410 hectare is Australia's largest botanical garden. Located between Campbelltown and Camden, south west of Sydney, Mount Annan has Theme Gardens, a Visitors Information Centre and Cafe.

10am - 4pm April to September
10am - 6pm October to March
(Closed Christmas Day) Phone 02 4648 2477

About
Australian Plants Society

In 1997 The Society For Growing Australian Plants NSW Ltd (often known as SGAP) adopted the name "Australian Plants Society" to better convey the wide-ranging activities and interests of the Society.

The Society for Growing Australian Plants NSW was established in 1957 by a group of people who "pledged to promote the establishment and breeding of Australian native plants for the garden, park and farm." By 1958 active regional groups had been established in six states and the ACT with a federal council (ASGAP) being formed in 1962.

Since that time the Society has continued to grow and expand its activities and in New South Wales alone has over 3000 members with District Groups operating throughout the region.

The activities of the Society are wide-ranging and include special interest Study Groups and the support of research through the Australian Flora Foundation.

The Society produces a range of books on native plants. It has been responsible for the establishment and maintenance of public native gardens, parks and reserves throughout Australia.

Members consist of people with broad and varying interests and backgrounds.

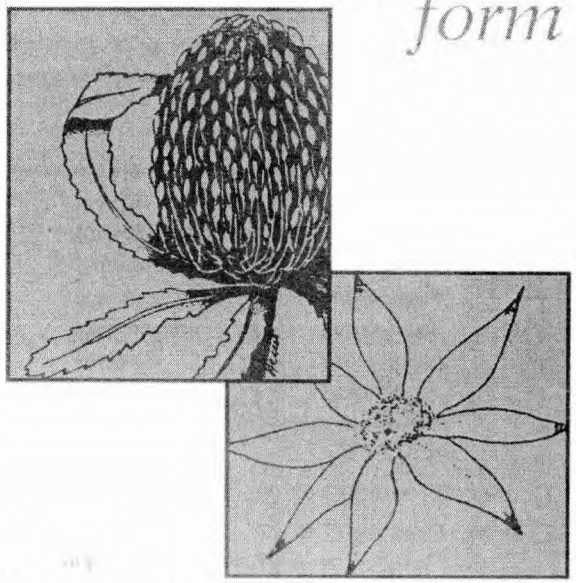
Whether you are interested in learning about the growing, conservation, ecology or diversity of the Australian flora, or you would just like to receive the Society's periodicals, we invite you to complete the membership form and ...

Join us today!

The Australian Plants Society is an independent, non profit, voluntary organisation.
(The Society for Growing Australian Plants NSW Ltd. ACN 002 680 408)

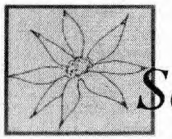
AUSTRALIAN PLANTS SOCIETY

Membership & Information & Application *form*



Our aims:

- To encourage the growing and use of Australian native plants in home gardens and public places.
- To promote the study and appreciation of Australian native plants.
- To pass on our knowledge as widely as possible.
- To protect native plants and their habitats.



As a Society Member you will...

- Learn more about Australian plants.
- Receive information and advice on growing Australian native plants.
- Have the opportunity to meet people with similar interests through a District Group or Study Group.
- Be able to join in conservation projects organised by District Groups.
- Have the opportunity to participate in enjoyable activities such as bushwalks, garden visits, talks and planting projects organised by District Groups.
- Receive quarterly issues of the full colour periodical **Australian Plants** and the Society's informative newsletter **Native Plants for NSW**.
- Receive discounts on Australian plant books.
- Be able to obtain Australian native plant seeds.
- Receive one half-price passenger vehicle entry pass to Mount Annan Botanic Garden per year.
- Have the opportunity to attend interesting conferences and meetings held around Australia.

General Enquiries

Ph: (02) 9621 3437
Fax: (02) 9676 7603
Mail: PO Box 744, Blacktown NSW 2148
If you have internet access
email austplantssocadmin@nectar.com.au
or visit the Society's Home Page at:
http://www.ozemail.com.au/~sgap

MEMBERSHIP APPLICATION FORM

MEMBERSHIP TYPE: *Please tick appropriate box*

	Annual Fee	Concession
Single:	$35 ❑	$28 ❑
Joint: *(2 Adults at same address)*	$40 ❑	$32 ❑

CONCESSION applied for: Limited Fixed Income ❑ Full Time Student ❑

Overseas: $50 ❑ Australian Currency

PERSONAL: *Joint members please complete a) and b)*

a) Mr ❑ Mrs ❑ Miss ❑ Ms ❑ Dr ❑

Given Name(s): _____

Surname: _____

b) Mr ❑ Mrs ❑ Miss ❑ Ms ❑ Dr ❑

Given Name(s): _____

Surname: _____

Postal Address: _____

_____ Postcode: ☐☐☐☐

Tel: ( ) _____

Work:( ) _____

Fax: ( ) _____

PAYMENT: Payment of $ _____ is enclosed by:

Cheque ❑ Money Order ❑ payable to SGAP NSW. Ltd

Or Please charge my:

Bankcard ❑ Mastercard ❑ Visa Card ❑

Card Expiry Date ____ / ____ Credit Card No:

☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐

Card Holder's Name _____
Please Print Clearly

Card Holder's Signature _____

Please return this completed form with your payment to:

Membership Officer
Australian Plants
PO Box 38, Woodford NSW 2778
Ph: 02 4758 6637 Fax: 02 4758 7169

Please indicate where you obtained this application form, e.g. a friend, a Society member, a garden show.

_____

We would appreciate your responses to the following questionnaire. This information is for the Society's use only and will help us to plan future activities that best meet the needs of our members:

Please tick appropriate age group(s)

Under 16 ❑ 17-21 ❑ 22-29 ❑ 30-39 ❑ 40-49 ❑
50-59 ❑ 60-69 ❑ 70-79 ❑ 79+ ❑

INTERESTS:

My/our interest(s) in Australian plants are:

Appreciation	❑	Learning	❑
Growing	❑	New Garden	❑
Propagation	❑	Professional	❑
Research	❑	Landscaping	❑
Conservation	❑	Bushcare/Landcare	❑
Photography	❑	Art/Craft	❑
Garden Visits	❑	Field Trips	❑

Please state any special interests/skills. _____

_____

_____

Would you be willing to assist?:

As a Volunteer Worker? ❑ Yes

As a source of information or help in your area of expertise or specialised interest? ❑ Yes

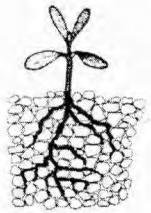
My /Our area of expertise is: _____

_____

_____

District Group:

TRAIN YOUR PLANTS



to be water wise

You need to train your plants to be water wise, just the way you would train your pets to behave. The more you give into them, the more demanding and less self supporting they become.

Most plants have been growing under controlled conditions in the nursery, with water sprinklers that come on at regular intervals, sometimes 2 or 3 times a day.

Therefore in order to become less water demanding and more dry-period tolerant when you get them home, your plants need to be *gradually weaned* off their previous high water dependency cycle.

Start the water wise process by:

- Watering the plant thoroughly at well spaced intervals. Don't give your garden light and frequent sprinkings of water just to " freshen things up".

The roots of your plants should be encouraged downwards, as a result of occasional deep watering, rather than upwards as a result of frequent light surface watering.

- Directing the water around your plants root area, in an imaginary line circling down from the plants outer foliage. This area is called the plant's dripline.

- Watering in the cooler parts of the day, early morning is best but probably evenings are most convenient for busy working gardeners.

AUSTRALIAN PLANTS SOCIETY

A friendly word of advice.....

Australian natives that are planted out and not properly watered during the first few months will rarely thrive, and may even die particularly if they are neglected during extended periods of dry weather.

In other words you can't simply dig a hole, plant an Australian native, let it dry out, and expect to get the results you are lookIng for, a healthy garden specimen!

However once properly established, most native plants will grow and thrive in the garden with minimum watering and require very little ongoing maintenance.

By following a few simple procedures you will have a garden with plants that look attractive and use less water.

General Inquiries:

P.O. Box 744, Blacktown NSW 2148
Phone 02 9621 3437
Fax 02 9676 7603

Membership:

P.O. Box 38, Woodford 2778
Phone: 02 4758 6637
Fax 02 4758 7169

How to establish

AUSTRALIAN PLANTS



the waterwise way

Australia is indeed the lucky country, for it has been favoured with one of the most unique and diverse ranges of native plants found anywhere in the world.

Our native plants have adapted, grown and flourished under the wide range o climatic conditions and soil differences that occur throughout this, the driest of all continents.

This guide has been produced to help you establish and grow Australian plants successfully in your garden and be rewarded with years of enjoyment.

The Society for Growing Australian Plants NSW Ltd
ACN 002 680 408

IMPROVE YOUR SOIL

Before you start planting, it is worthwhile to know the type of garden soil you have and to consider ways of improving it.

If for instance you are starting a garden in a new subdivision then chances are that most of the top soil has been removed and you will need to improve the ground before you start planting.

Adding compost and organic matter to your garden helps break up clay soils, improves the water holding ability of sandy soils and encourages worms, which help to aerate the soil.

GROUP YOUR PLANTS

As you will have noticed, from looking around nurseries and reading gardening books, not all plants like to be grown under the same conditions.

Some plants like the sun, others shade, some grow best in moist soils others prefer it a little on the dry side, some need protection from winds and cold, others thrive in open, exposed positions.

For best results select plants that will grow well in the chosen area, and group plants with similar water and cultural requirements in the same general areas of your garden.

This allows you to keep the plants that need regular watering in one area and to more easily control and gradually reduce the amount of water needed by the majority of sun loving Australian plants.

PLANTING PROCEDURES

- Thoroughly soak the soil around the plant in the container.

- If you are planting into an established garden bed with well cultivated soil then simply dig your planting hole to the same depth as the container from which you are planting, and a little wider. Fill with water and let it drain.

If you are planting in a new garden, where little or no soil preparation has been done, it is a good idea to loosen the soil for about 1 square metre and then ideally dig the whole area over to a depth of around 30cm. Then make your planting hole the same as for the established garden.

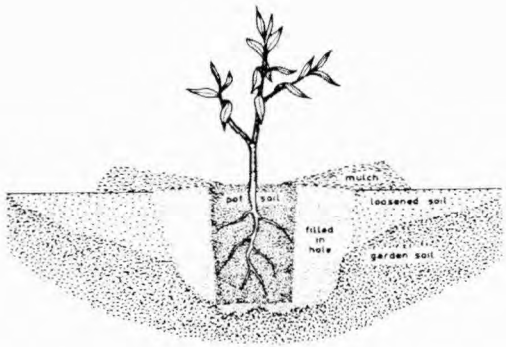
- Removal of the plant from the container is easy if the plant is in a pot. Place your hand over the pot surface with the stem of the plant between your second and third finger. Tap the edge of the pot on something solid and remove the plant and soil ball in one piece.

- At this point check the roots. Curling roots must be straightened out.

- Place the plant in the hole with all the roots pointing downwards.

- Gradually fill in the surrounding space with soil and firm down with your hand or foot and make sure the plant finishes up at the same level with the soil as it was in the container.

- Thoroughly water your new plant to settle the soil around the roots.



MULCH - MULCH - MULCH

Spread a suitable mulch around the new plant, taking care not to place mulch right up against the base of main stem, as this may cause collar rot.
For fertilising,consult your local nursery.

Mulch is any material that can placed on top of the ground that act as an insulator between the sun's rays and the earth. Mulch reduces the rate of evaporation of water, protects the plant's root system from rapid temperature changes and helps limit the growth of weeds.

So with the ability to fulfil three of the most important roles in development and success of your garden you should mulch at every opportunity.

Mulch can range from old newspaper to straw, leaf litter, bark chips, pebbles and even living native groundcovers.

Note: *Moisten the ground before you apply your mulch.*

Excerpts taken from: *Australian Native Plants* - John Wrigley : Illustrations - Murray Fagg

The *Nursery* Papers
ESSENTIAL INFORMATION FOR AUSTRALIAN PROFESSIONAL NURSERY OPERATORS
EDITED BY IAN ATKINSON, NATIONAL IDM ISSN:1326-1495 ISSUE NO:1998/016

Lies, damned lies and statistics!

NIAA and HRDC have commissioned the Australian Bureau of Statistics (ABS) to conduct a special survey of the Australian Nursery Industry. Preliminary figures are now available about the size of the production or wholesale sector of industry for the 1996/97 financial year. These tables are not from the ABS but have been derived by the author from data supplied by them.

Figures like these are essential for individual business planning and for industry to negotiate with governments about major issues. We are reliant on members of industry to fill the ABS forms out as accurately as possible. It's become evident that the level of record keeping within industry is a major limitation to the collection of more accurate statistics. Unfortunately we are unable to supply tables for the retail sector at this time because of difficulties with interpretation of the collected information.

In Table 1 we can see that the NSW and Victorian industries sold a similar amount of product in 1996/97 but Victoria used less land to do so. New South Wales has the most growers.

Table 1: Size of production industry by state in 1996/97

Location of businesses growing plant material	Number of production businesses*	Total area (m2) of land used for growing plant material for sale	Total value of material sold plant (farm gate not retail)
NSW	1434	12,787,000	$166,580,000
Victoria	643	10,750,000	$166,533,000
Queensland	751	10,498,000	$112,506,000
SA	230	3,287,000	$38,885,000
WA	261	3,378,000	$36,525,000
Tasmania	114	1,627,000	$14,075,000
NT	20	240,000	$2,147,000
ACT	13	98,000	$2,442,000
AUSTRALIA	**3046**	**42,665,000 m2**	**$539,691,000**

***(Must have gross sales of more than $5,000 a year)**

The areas under shadehouse and greenhouse in Table 2 as expected show a greater use of greenhouses in the cooler states and more shadehouses in the warmer states. This information should be very useful for allied traders involved in the supply of greenhouse and shadehouse coverings.

Table 2: Area of structures used for plant production, 1996/97

Location of businesses growing plant material	Area (m2) of shadehouse used for plant used for production	Area (m2) of greenhouse used for plant material production
NSW	1,028,000	607,000
Victoria	667,000	688,000
Queensland	1,080,000	284,000
SA	153,000	221,000
WA	288,000	109,000
Tasmania	43,000	64,000
NT	29,000	3,000
ACT	13,000	13,000
AUSTRALIA	**3,302,000**	**1,989,000**

Growers should find the information in Tables 3 and 4 quite useful when considering changes to your product mix. If for instance you were considering getting involved in the production of fruit trees in large containers you can see that they only represent 1.3% of total industry sales. Gearing up to supply the landscape trade? Represents 14% of total sales, about a quarter of the home garden market. How significant is container size in sales of palms and ferns? 72% of all sales of 'palms and ferns' were made in containers from 76mm to 300mm in size and only 14% in large containers or bags.

Table 3: Value of greenlife sales made to various market sectors by production nurseries in 1996/97

Market sectors	$ value of sales	% total sales
Home gardeners (via retail)	296,351,000	54.9
Landscapers	75,561,000	14.0
Production horticulture eg orchardists	51,415,000	9.5
Other nurseries for growing-on	51,241,000	9.5

Wholesale markets, cash & carry	38,815,000	7.2
Revegetation, Greening Australia etc.	26,309,000	4.9
TOTAL SALES	**539,691,000**	**100**

Table 4: Sales of various greenlife products by category, as a percentage of total greenlife sales made by production nurseries in 1996/97.

Pots less than 76mm (diam)	**%**	**Pots 76mm to 300mm**	**%**
Bedding plants	10.1	Roses	3.4
Vegetables	2.9	Potted colour	7.0
Houseplants	1.9	Houseplants	6.8
Palms and Ferns	0.7	Palms and Ferns	4.2
Native trees and shrubs	4.1	Native trees and shrubs	11.8
Exotic trees and shrubs	2.6	Fruit trees and vines	3.5
Total	**22.3**	Other exotic trees & shrubs	17.4
		Total	**54.1**
Pots over 300mm and large bags	**%**	**Other plant material**	**%**
Houseplants	0.4	In ground / bare rooted	6.9
Palms and Ferns	0.9	Seeds	1.7
Native trees and shrubs	2.2	Bulbs	2.3
Fruit trees and vines	1.3	Miscellaneous	5.4
Other exotic trees & shrubs	2.5	**Total**	**16.3**
Total	**7.3**		

Undoubtedly there will be some debate about the accuracy of these figures. The bottom line is that we can only use the information you provide and the final figures reflect your record keeping and the effort devoted to filling out the forms accurately. It's likely that another survey will be conducted in 1999, partly so that significant industry trends can be identified.

Acknowledgments

The figures presented here are a result of the 'Nursery, Cut Flower, Florist, Hiring of Plants and Turf Statistics Survey 1997' (green form) conducted by the ABS in accordance with a NIAA/HRDC project. The compilation of tables was undertaken by Ian Atkinson, Industry Development Manager.



EDITED BY IAN ATKINSON, NATIONAL INDUSTRY DEVELOPMENT MANAGER. ISSN:1326-1495

More lies, damned lies and statistics

Results of the 1996-97 census of the Australian nursery industry are now available. The census was conducted for the NIAA and HRDC by the Australian Bureau of Statistics. A paper based on this work and called 'Lies, damned lies and statistics' was published late last year.This paper provides a further insight into the production/wholesale sector of the industry.

Where are the retail figures?

Unfortunately, there were some fundamental problems with the way the 1996-97 census was conducted, the outcome of which is that the NIAA has reached agreement with the ABS not to publish the retail figures. They were so far from any reasonable estimate of the industry's size and value as to be meaningless. NIAA and HRDC are working with the ABS to ensure that the next collection does not suffer from the same problems.

Value of employment by production nurseries

During 1996-97, the industry invested more than $215 million in wages and salaries for the production of nursery stock. NSW had the largest bill at $64.5 million. Next was Victoria at $63.5 million, Queensland $43.8 million, Western Australia $16.3 million, South Australia $16.2 million, Northern Territory $10 million, Tasmania $7 million and the Australian Capital Territory $3 million.

Table 1: Number of production nurseries by average number of employees (including owners working in the business)*

	1 to 3	4 to 9	10 to 20	21 and over	Total
NSW & ACT	723	208	50	31	**1,012**
Victoria	230	159	59	39	**487**
Queensland	366	187	39	20	**612**
SA	74	58	22	9	**163**
WA	83	69	23	7	**181**
Tasmania	56	18	6	5	**85**
NT	11	5	1	0	**17**
Australia	1,544	704	199	111	**2,556**

***Note: only includes those businesses earning more than 50% of their income from the production and sale of nursery stock.**



Value of employment by production nurseries ($ millions)

Where are the plants going?

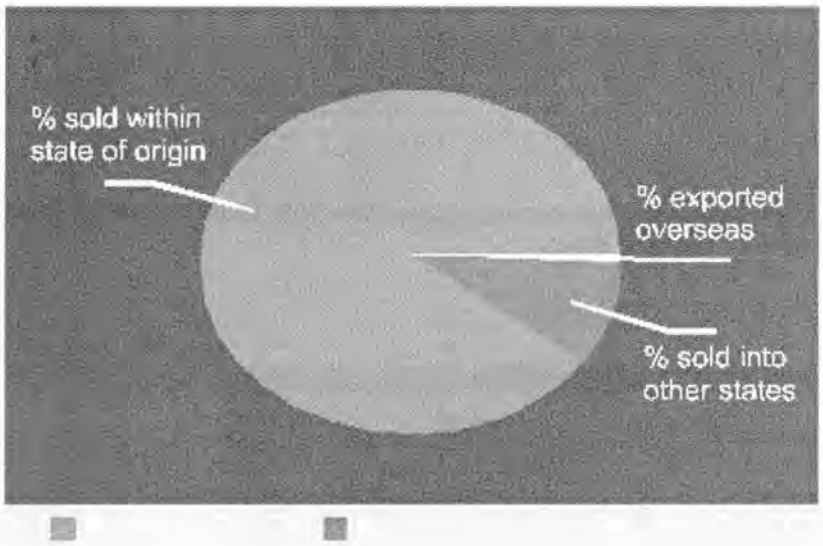
Only 0.7 % of the sales of nursery stock by production nurseries were for export overseas. The national trading nature of the Australian nursery industry is evident in the fact that 10.2 % of total sales were made into states other than where they were grown. The remaining 89.1 % were sold within their state of origin.

Interestingly, Tasmania had the highest percentage of sales for export (2.1 %) and sold interstate (19.6 %). Not surprising is the low interstate sales from Western Australia (1.2 %).

Number of small businesses in the industry

It comes as no surprise to anyone that the industry is made up mainly of small businesses. In fact, 60% of the total number of production nurseries have between one and three staff, including working owners. There are however, some distinct differences between the range of business sizes among the three biggest states, Queensland, Victoria and New South Wales. These statistics show that Victoria has a greater concentration of larger businesses.

In Victoria, 20 percent of businesses employ 10 or more staff. This drops to 9.6 % in Queensland and they represent only 8 % of the total in NSW.



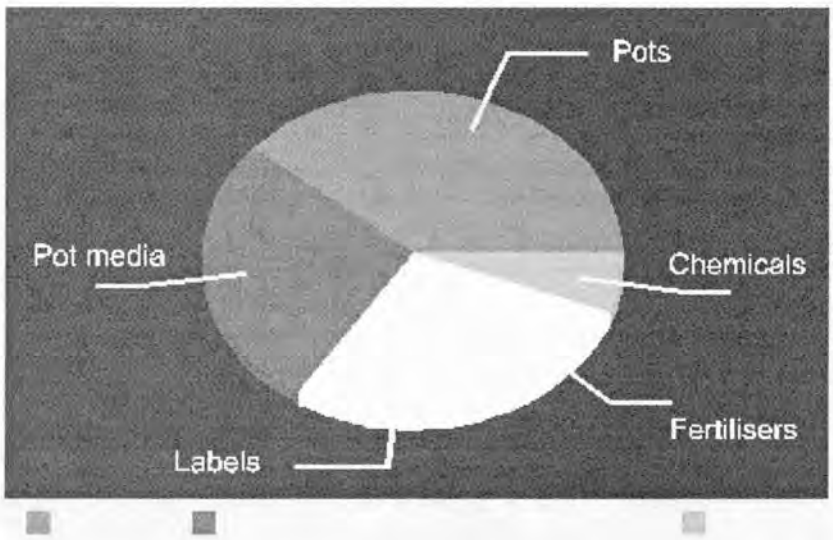
Distribution of sales (%) of nursery stock

Value of allied trades

The biggest allied trades sector (for inputs into production nurseries) is the sale of pots and other containers at over $27 million in 1996-97. Next were potting media supplies at $18.6 million, labels $10.7 million, fertilisers nearly $9 million and plant protection chemicals at over $4 million. There are also some interesting differences between the states.

Table 2: Wholesale or farmgate value of sales of nursery stock for various markets ($'000)

	Aust	NSW/ ACT	Vic	Qld	SA	WA	Tas	NT
To retailers for home gardens	407,349	129,099	129,338	70,947	32,794	32,054	11,145	1,972
Landscapers/ plantscapers	75,559	24,325	20,321	24,211	1,421	4,475	656	150
Farmers/forestry/production/ horticulture	77,722	23,774	21,448	11,247	8,813	7,182	5,203	55
Other nurseries for growing on	1,241	14,406	13,195	16,479	4,323	1,973	685	36
Wholesale	38,815	13,533	11,168	9,052	699	3,500	552	312
TOTAL	650,688	205,137	195,470	131,936	48,050	49,184	18,241	2,525



Relative value of allied trades sector sales ($ millions)

Table 3: State-by-state percentage of sales by production nurseries to various markets

	NSW/ACT (%)	Vic (%)	Qld (%)	SA (%)	WA (%)	Tas (%)	NT (%)
Market sector:							
To retailers for home gardens	63	66	54	68	65	61	78
Landscapers/ plantscapers	12	10	18	3	9	4	6
Farmers/forestry/production horticulture	11	11	9	18	15	29	2
Other nurseries for growing on	7	7	13	9	4	4	1
Wholesale markets	7	6	6	2	7	2	13

Table 4: Expenditure on various inputs by production nurseries ($ thousands)

	Pots and containers	Labels	Fertilisers	Plant protection chemicals	Potting media
NSW & ACT	8,691	2,963	2,685	1,086	6,077
Victoria	7,555	4,062	1,833	1,282	5,758
Queensland	6,088	1,474	2,617	958	3,824
SA	1,769	944	542	207	909
WA	2,591	943	1,091	366	1,685
Tasmania	588	265	150	143	313
NT	85	29	33	10	82
TOTAL	27,367	10,679	8,974	4,052	18,649

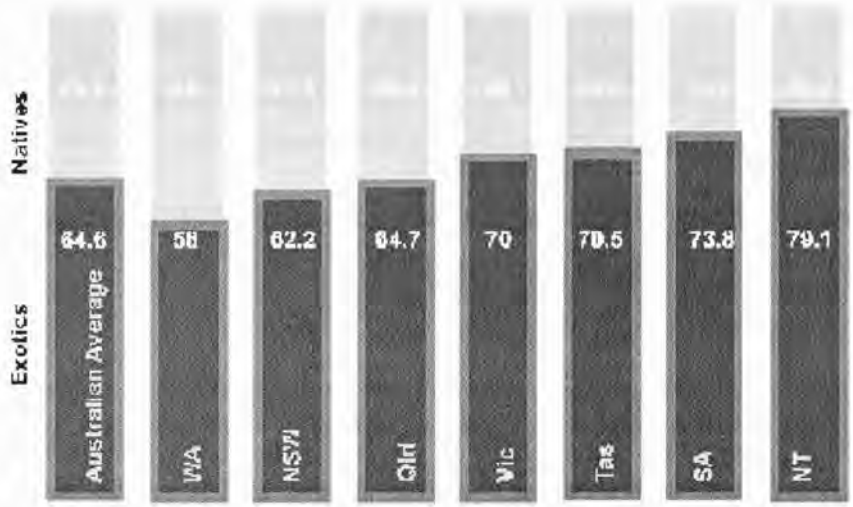
Cost of water and heating

Industry spent a total of $6.8 million on water and nearly $5 million on heating to grow nursery stock in 1996-97. As expected there are major differences between various regions both in terms of total expenditure and also in relative costs.

Differences can be misleading as expenditure is a function of both the unit cost and the amount used. ABS provides figures which allow a comparison of the

relative contribution of water and heating to the cost of production.

Comparison of % plant sales - exotics vs natives



Victoria and South Australia both averaged the highest expenditure on water at 4.3% of 'Total Current and Capital Expenditure by Production Dominated Nurseries'. Northern Territory had the lowest expenditure at just 1.9%. The relative cost of heating was highest in Tasmania at 4.8%, and range down Victoria 2.8%, NSW 2.6%, South Australia 2%, Western Australia 1.7%, Queensland 1.6% and the Northern Territory just 0.4%.

How important are Australian natives in the trade?

Sales of Australian native plants made up 35.4 % of total sales by production nurseries compared to 64.6 % exotics. Western Australia has the highest (44 %) proportion of sales as natives and the Northern Territory the lowest (20.9 %). From highest to lowest, the other states range from NSW (37.8%), Qld (35.3%), Victoria (30%), Tasmania (29.5%) and SA (26.2%).

For more information

Some of the other results of this survey are available in *The Nursery Papers* issue 1998#016 'Lies, damned lies and statistics'. Full sets of the results are available from the ABS for $175.

Acknowledgments

The interpretation of the ABS results for this paper was done by Ian Atkinson, Nursery Industry Development Manager. Many thanks to everyone who contributed to the original census as without your assistance this would not be possible.



EDITED BY RICHARD STEPHENS. INDUSTRY DEVELOPMENT MANAGER. ISSN: 1326- 1495
Issue no. 2001/01

The expanding overseas market for Australian nursery product

Overseas markets offer extensive opportunities for Australia to increase the value of its nursery production. NIAA, HRDC and AHC have been working together to provide Australian nurseries with the information required to enable them to benefit from the rapidly increasing worldwide consumption of potted plants. Information is freely available on all aspects of nursery export, including quarantine, packaging and shipping. While setting up an overseas export market may not be easy initially, the potential rewards are there for Australian businesses to expand, grow and prosper. This Nursery Paper gives an overview of current world trends, describes opportunities available in Japan and details how nursery businesses can get started in the export market. All monetary figures quoted are in Australian Dollars.

World Trends

Worldwide demand for potted plants continues to increase rapidly. The anticipated total consumption for the year 2000 is around $35 billion Australian dollars. This is up from $31.6 billion in 1995 and $23.6 billion in 1990.

The USA has the largest share of world consumption, followed by Germany, Italy and France. The total value of exported potted plants has risen from $2.9 billion to $6.7 billion in recent years, with the Netherlands, Denmark and Belgium being the main exporters.

As the demand for nursery product continues to grow, competition in world markets will also increase. The highest growth is expected in Japan and the USA. New markets are also emerging in the Eastern European countries, Latin America and some other Asian countries

Opportunities

Japan is one of the world's largest consumers of potted plants and cut flowers. While the average per capita consumption of both cut flowers and potted plants in Japan is high, individual flower and nursery/ garden products consumption is lower than in other industrialised countries. This can be explained by 70% of total consumption is from businesses handling ceremonial occasions, such as weddings and funerals, and businesses supplying decorations and corporate gifts.

However, with a trend to a more European life style, individual purchases of nursery product in Japan will continue to rise. In 1997, Japan imported $371 million of nursery product, 67% of which came from Europe. In addition, Japan's population of 125 million has a very strong purchasing power with a per capita GDP (Gross Domestic Product) of $40,400, compared to Australia's $21,600. Other factors that make the Japanese market attractive is that the traditional distribution systems in Japan are being simplified and are now more likely to involve a single distributor.

Another potential overseas market is Taiwan. Taiwan imported $362 million of nursery product in 1997. However, 98% of this was from Europe. The reasons for this are unknown but further investigation may reveal another opportunity to supply Australian nursery product.



Further and regularly updated information on export opportunities is available from the NIAA website at www. niaa. org. au

Australia's major nursery export markets are currently the USA, Japan, New Zealand, the Netherlands, Israel and the United Kingdom. While the official export value figures have fluctuated wildly over the past 10 years, exports have continued to increase and provided valuable income to participating producers.

Are you ready to export?

Export markets offer a greater opportunity to increase sales volume of sales of nursery product than available domestically. It should not be looked upon as a means of getting rid of excess product. Most successful exporters spend a lot of time and effort to modify and develop products to suit overseas market requirements.

For success, commitment to producing a consistent and high quality product is of the utmost importance. Implementing Quality Assurance (QA) and/ or the Nursery Industry Accreditation Scheme, Australia (NIASA) will help reduce production losses, ensure market requirements are met, provide easier access to Australian Quarantine Inspection Service (AQIS) export accreditation programs and provide a level of credibility and confidence with existing and potential clients.

Finding Export Markets

Most Australian nurseries that export developed their export markets through personal overseas contact. Others developed markets with the help of organisations such as Austrade, export consultants/ agents or have exported as part of a network group.

Doing some basic research by surfing the Internet, reading publications and/ or tripping overseas will help to ensure success in a foreign market. You need to be aware of:



- Intended and/ or potential plant uses.
- Climatic considerations.
- Currently suppled nursery product.
- Various import duties payable.
- Quarantine, custom, consumer labels and consumer protection regulations.
- Availability and cost of freight from Australia.
- Cultural differences that will affect the way business is done.

Preparing a Quote

Preparing a quote for an overseas market will require considerable thought and effort. You must know and understand the product specifications and importing countries requirements, such as:

- genus, species and cultivar of plant required;
- size and growth stage;
- container size, type and colour;
- number of plants and quality required;
- growing media restrictions, if any;
- treatments required prior to dispatch;
- prohibited plants; and
- any declarations and/ or certificates required. At the production end, you will need to know:
- your production costs;
- international communication costs;
- packaging and presentation costs;
- disinfestation and/ or pre dispatch treatment;
- export permits, AQIS phytosanitary; certificates and other declarations and their costs;
- freight forwarding costs customs, etc;
- royalty or licences cost to owner of PBR plant (if applicable);
- credit insurance, bank charges and any legal costs associated with preparing a contract; and
- your profit margin.



Exporting endangered species and/ or Australian natives

Australia has its own protocol regarding the export of native species and there is an international protocol governing the trade in endangered species. This protocol is outlined under the Convention for International Trade In Endangered Species (CITIES), under which Australia is a signatory. Environment Australia should be contacted prior to export of endangered and/ or Australian native species to ensure compliance.

Growing Media

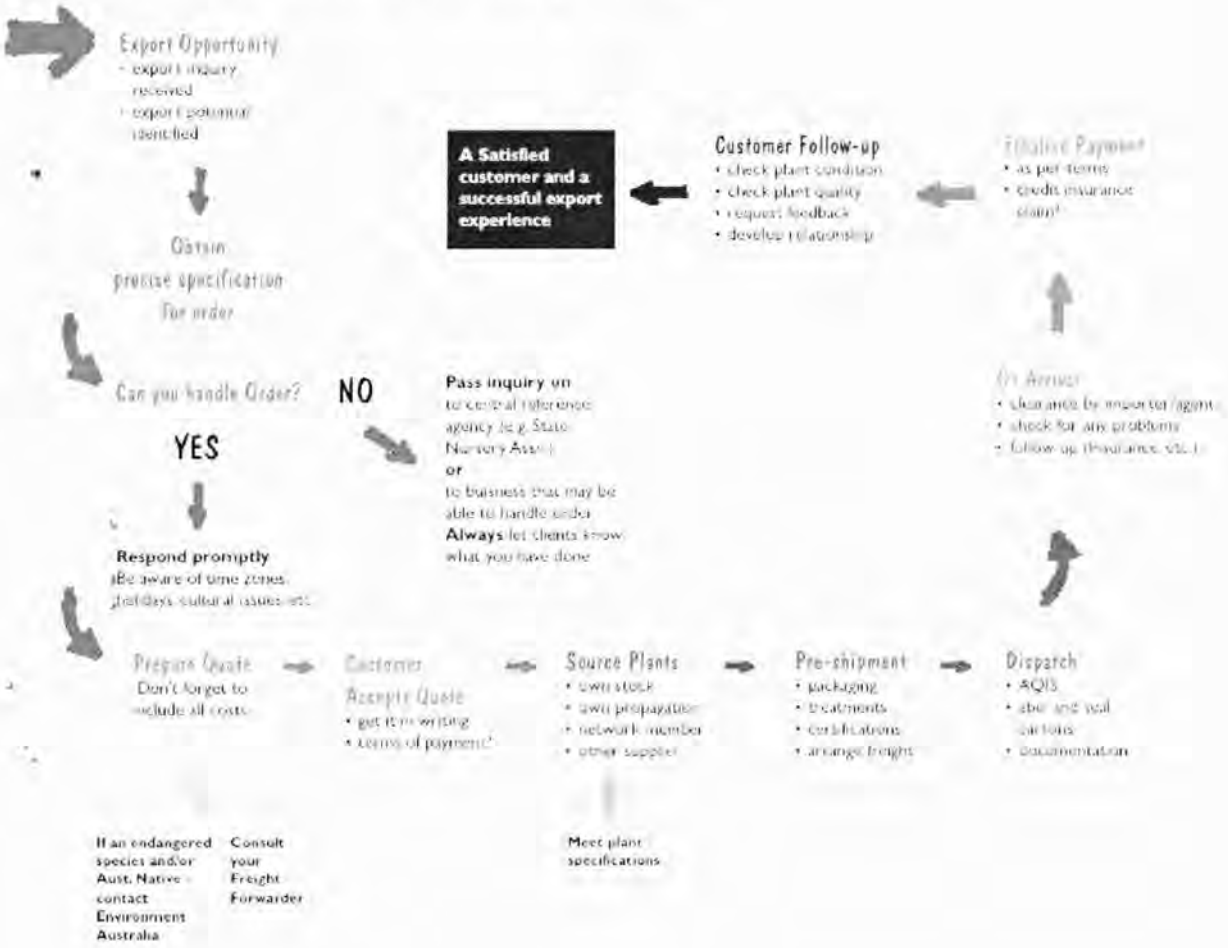
One consideration when exporting nursery product is its growing media. Many countries will not accept media that contains any form of sand or soil as the potential for carrying diseases such as pythium or phytophthora is a major issue. Soil- less media is almost universally accepted, with the most common for export being a combination of sphagnum peat and perlite.

Peat and perlite/ vermiculite mixes can be difficult to wet and are known to dry out relatively quickly. But, generally speaking, there are no quarantine issues and the mix is lightweight.

Composed pine bark, which usually contains a wetting agent, doesn't dry out as easily as the peat and perlite mixes, but can become water logged. The variation in particle size and type of bark can also cause problems. The higher weight is offset by the lower purchase cost.

Plants that are bare rooted, washed and wrapped in wet paper have very poor survival rates. While there is minimal cost and weight, this option is high risk and requires skilled operators at both the departure and destination points.

A flowchart for the export of nursery product

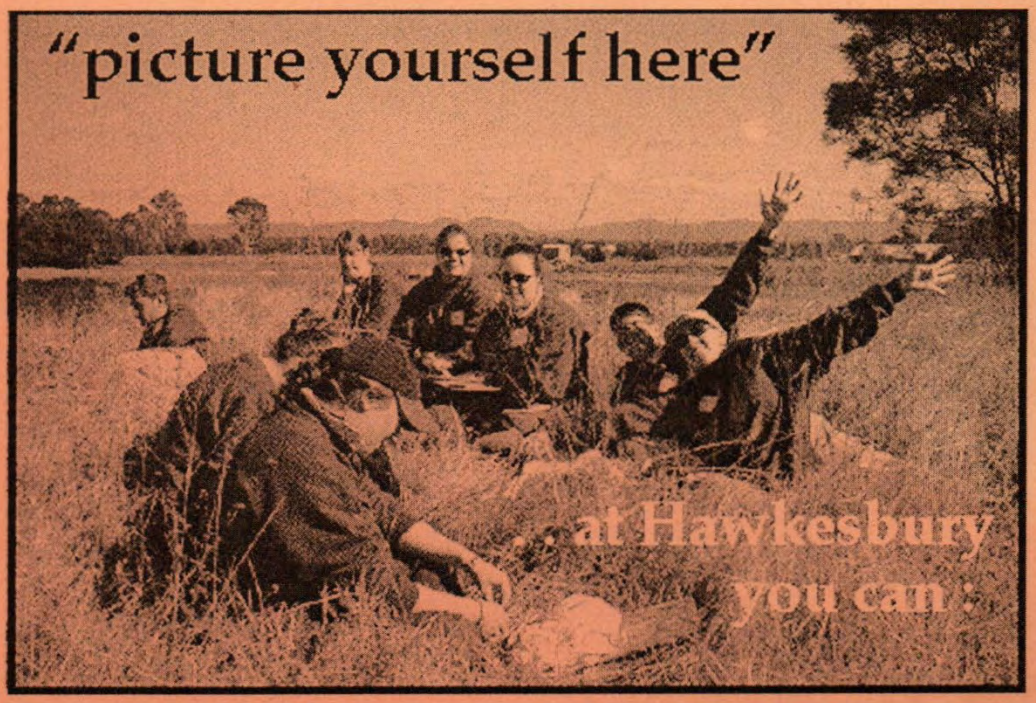


Help is available

The flow chart depicts a process that can be used in order to achieve a successful export experience. This flow chart and cartoon graphics were taken from the NIAA publication 'A Beginner's Guide To Nursery Export', edited by Garth Hayes. This publication describes in greater detail the export process, and has an extensive list of key contacts useful for developing nursery export markets. It is available from State Nursery Industry Associations and NIAA, phone 02 9876 5200. Export information for the nursery industry is regularly updated on the NIAA website www. niaa. org. au .

Acknowledgements

This paper was prepared by Richard Stephens, Industry Development Manager, with the assistance of Robert Bateman, from Birkdale Nursery, Qld, and Lance Carr from Mountain Range Nursery, NSW. Cartoon drawings originally by Keith Bodman. Information was gained from the NIAA website and publication 'A Beginners Guide To Nursery Export'.



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