HARDEN MURRUMBURRAH LANDCARE GROUP INC

NATIONAL LANDCARE PROGRAM
BG0239.94

SUSTAINABLE SYSTEM FARMING DATABASE

FINAL REPORT

Further information please do not hesitate to contact
P. Holding, Chairman, HMLG, PO Box 145, Harden. NSW. 2587

PROJECT DETAILS

TITLE: Sustainable Systems Farming Database

PARTICIPANTS: Members of the Harden Murrumburrah Landcare Group (HMLG)

PROJECT DURATION: 1994 - 1997

LOCATION: Harden Shire

ACKNOWLEDGMENTS: The members of the Database Committee would like to acknowledge the support given to this project by the National Landcare Program, the members of the Harden Murrumburrah Landcare Group (HMLG) and

1994 - CSIRO, Division of Plant Industry, in particular John Angus, John Kirkegaard, Maarten Stepper and Chris Fairal, Charles Sturt University, in particular Jim Prattly and Justin Hughes, Chandlers IAMA, Reids Fertiliser, R&N Gebhardt, Harden Consulting Service, NSW Farmers (Harden Branch), NSW Agriculture and Harden Shire Council

1995 - CSIRO, Division of Plant Industry, Chandlers IAMA, Reids Fertiliser, R&N Gebhardt Incetic, Kennett Rural Services, NSW Agriculture, Harden Consulting Service and Harden Shire Council.

1996 - Chandlers IAMA, Harden Consulting Service, R&N Gebhardt, Reids Fertilisers and Kennett Rural Services, NSW Agriculture, Harden Shire Council and Charles Kidd, Research Agronomist with IAMA, South Australia.

1997 - Chandlers IAMA, Harden Consulting Service, R&N Gebhardt, Kennett Rural Services and Alcorns Fertilisers, NSW Agriculture, Harden Shire Council and Charles Kidd, Research Agronomist with IAMA, South Australia.

Harden Murrumburrah Landcare Group is very grateful for the continuing support and sponsorship from Chandlers IAMA, Harden Consulting Service, R&N Gebhardt, Kennett Rural Services, Alcorns Fertilisers, Harden Shire Council which has enabled this project to become self funding and continuing without National Landcare Funding.

COMMENTS FROM PROJECT PARTICIPANTS

"The HMLG Database has helped profitability of cropping enterprises through improving information on imputs, rotations and monitoring".
R. *Knight Gregson, 'Old Barwang', Galong.*

"The Database has provided the district and myself with management information effecting wheat yields across the district. The Database has highlighted many management strategies increasing wheat yields we already knew from trials results elsewhere. However, it has been important to have these confirmed in commercial practice. IT has also raised several questions that we cannot fully answer at this point in time.
It is helping farmers become more precise in their management skills particularly through the crop monitoring skills involved.
Probably the most important point is that it brings farmers together in a group which allows the transfer of information."
Doug Hunt, Agronomist, Wesfarmers-Dalgety/Kennett.

"The database has established some 'benchmark standards' for successful crop management. In many cases the Database has confirmed that most growers are following these standards eg liming/crop rotations, but nonetheless, due to varying seasonal conditions, results are demonstrating that some management decisions differ from year to year eg. Early v late autumn break".
Hugh Flanery, 'Goonawarra', Galong.

"My main target as a wheat grower is to get the highest kilograms of grain/millimetre of rainfall and one of the big benefits of the Database is that it allows me to see what the highest ranking farmers are doing to maximise their use of available rainfall and try to apply their techniques on my own property".
Ian McLeod, 'Ayrlie', Wallendbeen.

The Database has been a unique tool for the district growers. It provides an opportunity for farmers to validate their own management against district and best practice benchmarks. It has highlighted some of the key factors in crop production. At times some of these can be considered obvious, however, every year there are a large number of different factors which have been highlighted, to the surprise of many growers.
The database has also resulted in growers altering parts of their crop production system based on the results achieved. IT has been an avenue for growers to have a properly analysed set of paddock data which they put a high degree of value on. It has also provided the district with areas we need more information or research on.
Furthermore it has proved a critical tool for constant evaluation as it has been run over a number of years. The system has now built 'critical mass' with a good solid base of figures for the last four years. It is unique in the information it has delivered and is now an integral part of the Harden districts cropping system.
The system has been highly praised by both advisers and researchers, providing all sectors of the cropping community with a correct method for district comparisons. It has also provided an avenue for further improvement, agronomical, economically and sustainability.

Chris Duff, Chandlers IAMA, Harden

The Landcare Database gives me a great insight into the effectiveness of cropping management systems that are unique. We draw a great deal of useful information that allows me to advise clients more effectively providing a solid foundation to pursue further research.

Mark Barber, Harden Consulting Service

The Database has been an excellent means of being able to highlight to producers the major factors involved in producing high yielding, economic grain crops. The information gathered has enabled me to highlight to all growers good agronomic practices and draw on the strength of the top growers to assist all growers within the Landcare Group improve overall performance. It has shown the results of trials ring true in a commercial situation which has given growers more confidence in looking at trial results and encourage them to adopt the information presented. The database has acted as a common focus to look at crop programs and encourage them to share information for the betterment of all. Involvement has dramatically increased with the sharing of information something that is not seen in other industries.

The database has helped to make landcare more relevant to farmers and increased their willingness to stay involved. Adoption of information augers well for the future of the cropping industry and the viability of the industry in the Harden Shire.

Paul Parker, Agronomist, NSW Agriculture, Young.

PROJECT OBJECTIVES:

- Continue the project commenced in 1993-94
- Survey farmers cropping techniques and develop a database aiming to develop a picture of sustainability for cropping within the Harden Shire
- Allow identification of practices and management likely to maintain or improve yields in wheat in a sustainable manner.
- Encourage growers to monitor the growth and yield of their wheat and compare it to the performance of others in the district
- Assist researchers develop a model of sustainable cropping over the sheep/wheat belt of southern NSW.
- Results to promote sustainable cropping practices across the sheep/wheat belt.
- Develop 'best practice' cropping techniques to assist farmers with management decision making.
- Identify any need for future research, provide a 'forward scout', uncovering previously unknown information that may warrant further investigation.
- Provide a backup for researchers by the provision of a large number of paddocks under commercial production maybe able to test theories being evident in trials.

PROJECT DESCRIPTION

Aim to survey 50 farmers on cropping techniques to develop a database of crop management, to allow optimum use to be determined to sustain profitable production without causing environmental damage. This will enable a picture to be developed about the sustainability of cropping within the Harden Shire and assist in developing models for sustainable cropping over the wheat/sheep belt of NSW & Victoria.

The Landcare group will survey paddocks with the assistance of the Centre for Conservation Farming & CSIRO and collect detail of actual paddock practices, eg sowing and cultivation methods, yields, lime application, soil degradation, soil types and structure. The results will enable HMLG to promote sustainable agriculture practices with the group.

GENERAL OUTCOMES

- The group has seen enormous benefits in participating in the Database and the project has continued past the completion of National Landcare Funding and is now private funded through HMLG.
- More widespread use of soil testing
- Better understanding of the interaction of a variety of factors not just single issue. This is giving a broadening of views on sustainable agriculture
- Members are able to discuss other issues such as marketing etc as part of the database process
- Understanding what a vital ingredient lime is to increased productivity in this area. Even in years of low profitability the use of lime is a fundamental requirement for high productivity.
- Farmers have a greater understanding of the need to plan particularly rotation and monitor.
- Field Inspections, being three times a year, is bringing farmers together to discuss issues that are vital to the success of cropping in this area. (Agenda for some of the Field Inspections held are included in the Appendix)
- HMLG has been able to demonstrate the results and trends shown on research trial plots are true or otherwise in a commercial situation
- Improved expertise in cropping generally.
- District has definitely having less failures
- Achieved higher yields and therefore profits
- Provided an avenue to question and delete non-performing district practices.
- Provided support to get into reduced tillage or zero tillage with confidence and success

SPECIFIC OUTCOMES

In 1994

- Wheat yields were highly correlated to water use, the higher the water use the higher the yield.
- The benefits demonstrated clearly the importance of sowing date particularly in drier years.
- sowing date - every day after 15 May an average yield reduction of 34/kg/ha was observable.
- importance of rotation. Wheat after oats not an adequate break crop, consistent with data from CSIRO trials.
- Possible .5t yield benefit from lime application
- Sowing rate had little effect on final yield

In 1995

- Attempts were made to incorporate the data with TOPCROP however they did not have the ability to analysis the data. HMLG contact Fairport Technology, makers of the paddock recording program PAM (Paddock Action Manager) to include in there reports section all the parameters required by the 'HMLG Database'. This would enable growers to download data in Excel format and have it incorporated into a 'super set' for analysis without having to complete forms.
- Top yielding crops were grown on soil with high pH and 64.8% higher liming rate than average or 0.9t/ha lime applied.
- Sowing rate - 20.7% variance was shown with top crops being sown at the higher average rate of 80kg/ha.
- .4t/ha benefit in wheat following Canola, all paddocks had been limed so more than likely a combined benefit of lime and Canola.
- Top crops have a more complete set of data indicating that they are closely monitored a benefit in itself.
- Confirmed the benefits of good rotations, crop monitoring and the underlying benefits of participating in groups.

In 1996

- Confirmed benefits again of good rotations
- Importance of liming to increased yield
- Monitoring
- Total nitrogen needs to be assessed rather than applied at sowing
- Nitrogen applied on Wheat following wheat, oats or grassy pasture is highly questionable
- The lack of value of oats as a break crop
- Growers using same rates of fertiliser on all paddocks and achieving large variance in yields
- 90% of district sowing at 70-80kg/ha and achieving 100% variability in plant population

In 1997

- Analysed Data has not been completed at date of this report

Sample pages of each report and database collection forms are included in Appendix, complete copies are available if required.

COMMENT

The HMLG has found is very difficult to have their data professional analysed over the past three years, however, they have now successfully contracted Charles Kidd, a research Agronomist with IAMA in South Australia to complete the work. This has caused some disillusionment amongst participants but the group feels this has now been satisfied with the production of a detailed report back to members and benefits will continue to follow from this project.

PROCESS

A letter was mailed to all members of HMLG inviting them to attend a meeting to outline the project and what would be required from them as participants. (Appendix 1)

This meeting was addressed by Jim Partly, Dean of Faculty of Science & Agriculture, Charles Sturt University and Centre for Conservation Farming, Mr. Greg Fenton, Agriculture Research Institute, Wagga, Mr. Maarten Stepper, CSIRO and Mr. Justin Hughes, student from CSU. (Appendix 2)

A Sub -committee of HMLG was formed to manage this project and act as group leaders for the project. A data collection form was printed and mailed to participants. To encourage participants to complete the form a Field Day was held at the time of each Field Inspection, these information days have had an attendance vary from approximately 40 to 90 farmers.

Seven members of HMLG where appointed as Group Leaders for approximately 10 participants and where responsible for informing those 10 farmers about the dates for Field Inspections, information nights and encourage the completion of database forms each year. The HMLG Co-ordinator was responsible to the Sub Committee for the general coordination of the project and liaising the Group Leaders.

Field Inspection No. 1 - covered topics including germination counts, how to monitor your crops, a variety of machines and points, understanding your soil test results.
Field Inspection No. 2 - Sap nitrate testing, NIR, different types of spray units.
Field Inspection No. 3 - Disease identification, tillering, rotation (inspecting actually crops including wheat, canola, peas)
(Copies of some of the agendas, database collection form (sample page) and press coverage are included in the Appendix)

PUBLICITY

This project has received a large amount of publicity through numerous media outlets, copies of some of the articles published are included in the Appendix.

The project assisted with some of the results in the CSIRO's publications
'Research for Profitable and Sustainable Cropping' Land and Water Program
'Productivity and Sustainability from Managing Soil Structure in cropping soils of southern NSW and Northern Victoria with lighter textured surfaces"

The first report " The performance of Wheat Crops in the Harden-Murrumburrah District 1994" was presented as a paper at the Dryland Farming Systems Conference by Justin Hughes and Jim Prattley.

A copy of the results was mailed to every District Agronomist with NSW Agriculture and local private Agronomist, all Catchment Managers in NSW and all rural media outlets as well as a number of private commercial agencies and other groups that expressed an interest in the project.

Peter Holding, Chairman of HMLG addressed a CSIRO/Farm Management (organised by Dr. John Williams, CSIRO) conference outlining this project and the benefits to farmers and research working together in cooperative research to achieve outcomes that are of an overall benefit of all..

ATTACHMENTS

Letter of support from John Angus, Senior Principal Research Scientist
Photographs of farmers attending some of the Field Inspections
Sample of agendas for Field Inspections
Copies of publicity generated by the project.
Final report to farmers for data collected in 1994, 1995 & 1996
Copies of booklets produced by CSIRO are available upon request.

FINANCIAL STATEMENT

SUSTAINABLE FARMING SYSTEMS DATABASE

HARDEN MURRUMBURRAH LANDCARE GROUP
National Landcare Program Project No. BG-0239/94

INCOME RECEIVED		**18,000**
EXPENSES		
Printing Costs	$ 2,480	
Advertising Postage, Publicity, Phone	3,750	
Data analysis	11,770	
TOTAL EXPENSES		18,000
BALANCE		**NIL**

PLANT INDUSTRY
CSIRO AUSTRALIA

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4 March, 1996

Mr Peter Holding,
Chairman, Harden-Murrumburrah Landcare Group

Dear Mr Holding,

Support for HMLCG from National Landcare Program

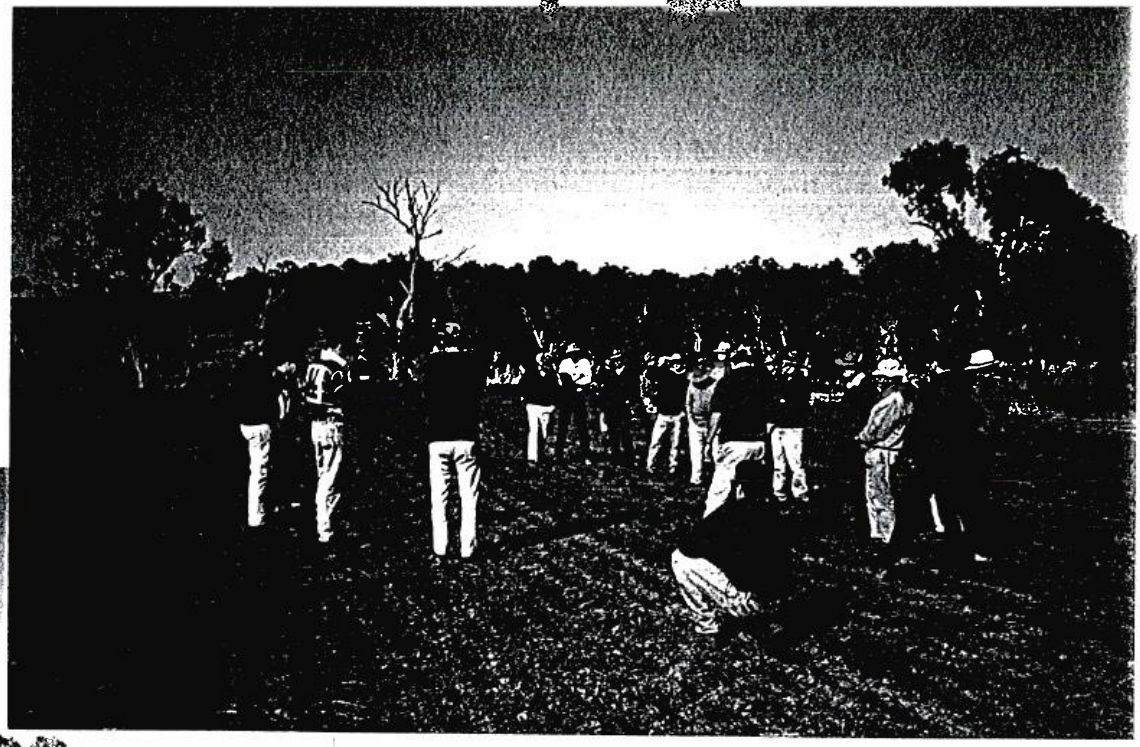
I am writing to offer my opinion on the value of the database project conducted by the Harden Murrumburrah Landcare Group over the past two years. I consider that it provides extremely useful information on production and sustainability both to local growers in the short term, and to the national landcare movement in the long term.

I am pleased to see the rapid feedback to members of the group and the publication of results at the recent Agronomy Society Conference.

The high level of grass-roots support from the community is providing better data than any other database project that I am aware of. CSIRO was pleased to provide support with software and data interpretation in 1995 and I expect that we can providing similar assistance in 1996.

Yours sincerely,

J.R. Angus
Senior Principal Research Scientist



FARMERS ATTENDING
FIELD INSPECTION NO. 1
Plant population, sowing depth,
weed counts, insects

NSW AGRICULTURE - CHANDLERS IAMA
HARDEN MURRUMBURRAH LANDCARE GROUP

DATABASE FIELD INSPECTION NO. 1 & 2

29 JULY, 1997 COMMENCING AT 3.00PM

STAN & ANNETTE HUME'S 'COLENSO', GALONG

(10km from Cunningar on the Boorowa Rd, Colenso Lane follow through to sheds)

TOPICS to be covered include:-

Field Inspection No. 1 - Seedling Numbers, sowing depth, weed counts, insects
Field Inspection No. 2 - Nitrate levels

Stubble Retention Trials and the effect on Canola (CSIRO & Charles Sturt Uni)

Tillage practices/ direct drill and their effect on wheat following canola

Pre emergent & post emergent sowing/pre emergent herbicide trial, comparing different mixes and their effect in zero till and direct drill situations

Nitrogen options for 1997

- Strategies in a potential dry year
- Implications of low district deep soil N levels and final yield
- Case studies on matching deep soil N tests and final yields over 3 years.

For further information please do not hesitate to contact your Group Leader or any of those below.

Kind regards

Sue Paul Louise

Sue - 863200 Paul - 821077 or Louise - 868218

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Harden Murrumburrah Land Care Group
with
Chandlers IAMA & NSW Dept of Ag.

HMLC

HMLC

Annual Field Day - Breakfast
Friday October 24 1997
7.45am for breakfast - 11am

This year we have decided to do something slightly different by inviting you to a breakfast meeting in the western part of the district. The morning will be held at Andrew & Suzie Forrest's property "Rothesay" on the Berthong Road. We will be addressing a number of important topics. These include weed resistance, canola and especially Rhizoctonia, which has been particularly bad this year.

7.45 - 8.30 Breakfast

- *Canola in 1997 and beyond*

The Dovuro Canola Variety Trial - Justin Kudnig (National Technical Officer)

Aphids & Heliothis in Canola. The impact of low insect levels now and what could happen in the next two weeks.

Triazine Canola Herbicide trial work

Transgenic Canola (herbicide resistant canola). How and when they will be available in Australia.

Recent trial results from Soil Biofumigation work.

NSW Agriculture

♦ *Herbicide Resistance is increasing!!!!*

Herbicide resistance is definately on the increase in this area. Peter Baines (research agronomist) conducts the resistance testing at CSU- Wagga and will talk on results and trends showing up in this region. Strategies for prevention and reduction of resistance will also be discussed. Peter will also talk on how to collect samples from this years suspect paddocks.

♦ *Rhizoctonia - why was it so bad this year??????*

Dr Percy Wong -Plant Pathologist - (Wagga Ag. Research Institute) will talk on a local level regarding the high infestation of Rhizoctonia bare patch this year. We have seen it in paddocks that have been disced, ploughed and direct drilled. Why has there been so much, and what can we do about it??

♦ *Grain Legumes*

Di Carpenter (Technical Officer - Pulses, Dept. Ag Wagga) will discuss the new release lupin varieties - both narrow leaf and broad leaf, which will be available for 1998. Di will also talk on the promising trial results with Chickpeas in the region.

Conclusion around 11am

Anyone interested in Faba Beans???

For those interested in Faba beans the meeting will then move to "Katrine Bank" -Steel Caldwells property at Thuddungra to look at the Faba Bean variety trial, seeding rate trial and 2 x time of sowing trials.

RSVP Louise on 868218 orSally at Chandlers 863200.
Numbers are essential for breakfast.
Transport is available if people are interested.

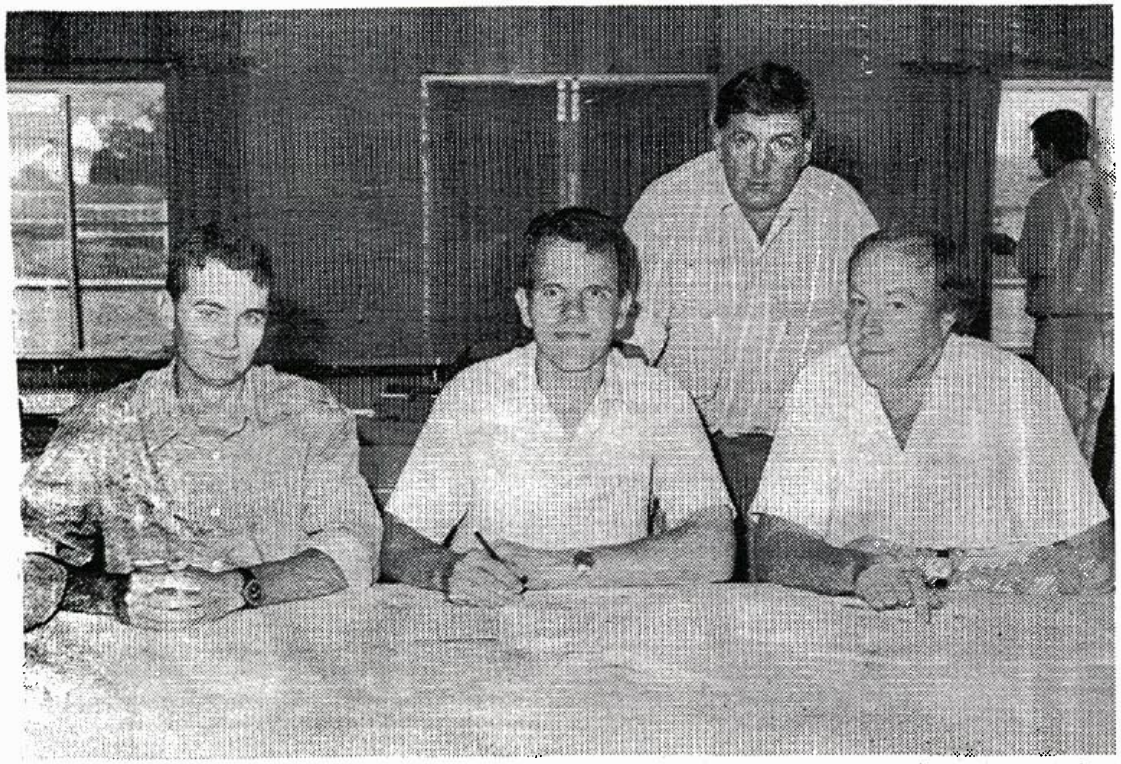
DIRECTIONS TO ROTHESAY

From Wallendbeen head to Temora and abount 14 kms from Wallendbeen turn right into Berthong road (about 100m past Cootamundra turn off on left). Travel approx 13kms until you see a sign on the right hand side.

From Young head to Temora for 20kms until you see the Berthong road on your left. Travel 5kms along this road until you see a sign on the left hand side.

EXPRESS 17/3/94

Maarten Stapper heads farming systems survey



Making life easier for farmers, scientists and farmers gathered at the Bowling Club to hear about Maarten Stapper's project for the Harden District. From left, student Justin Hughes, Maarten Stapper, director of CSU Jim Prattley and standing chairman of Harden Landcare Peter Holding.

The knowledge of farmers is highly valued by scientists, according to CSIRO Maarten Stapper, who is heading the farming systems survey in the Harden Murrumburrah district.

Mr Stapper said the survey was aimed at forming benchmarks for soil type and climate so that farmers were better able to manage their paddocks.

He presented the guidelines for the survey at the Harden Landcare annual general meeting, his main thrust to encourage farmers to participate.

"It is extremely important to use information from farmers to test our own ideas for suitability and use in the farming community," he said.

"Farmers know about their land and by interacting with them we can quantify the information into a good analysis."

In 1992 500 farmers and 15 consultants formed a team, which began as Farmfacts in 1985 with 80 farmers and two consultants.

Receiving sponsorship from Canberra, the National Australia Bank and chemical companies, the team organise annual meetings where they discuss issues, listen to experts, receive marketing ideas and look at human relations and how they can strengthen farm management.

"We have a good cross section of farms, some poor and some very good," Mr Stapper said.

"We want to develop guidelines on how to go from poor to good so that farmers can set goals for their own farms."

The analysis is expected to allow a "technology transfer" where farmers can compare with other farms and translate the differences.

Historical information will be combined with typical production patterns to arrive at the required benchmarks.

"We want farmers to know what they are doing in relation to each other, their potential production, the risk of land degradation and the ideal nutrient balance for their paddocks," Mr Stapper said.

"Our target is to have 50 farmers in Harden Landcare collaborate, each putting in three to five paddocks of wheat to be sown this year.

"With some 200 paddocks of wheat we will obtain detailed information on how they put their crop in, what they did with the stubble of the previous crop, how many workings or whether they direct drilled."

During the season Mr Stapper said farmers will meet in small groups headed by a co-ordinator to help do the survey.

Weeds, diseases and herbicide control will all be monitored and field days and training sessions will be incorporated to keep the 50 participants abreast of all developments.

"Once we have arrived at benchmarks, farmers will be able to monitor their crops during the season and make corrections according to what they know," Mr Stapper said.

He believes the results of the survey will form an important learning tool, increasing their knowledge of farming crops to make better judgements.

The Victorian and NSW departments of Agriculture, the Department of Conservation and Land Management and the Department of Conservation and Natural Resources are behind the project, instigated by the CSIRO.

"We want to increase productivity, increase profits and maintain sustainability," Mr Stapper said.

He said the survey would also be instrumental in sending a message to the government, giving an insight to the real economics of sustainable agriculture.

EXPRESS

Treefest 3 South Aust

Following the outstanding success of the Second National Treefest held in Harden Murrumburrah last October, the challenge to hold the third has been accepted by the South Australian Treefest '95 working group.

Expressions of interest were submitted to the Second National Treefest committee from New South Wales, Victoria and South Australia.

But it was felt the exciting challenges undertaken and being adopted in South Australia, a different environment from Harden Murrumburrah and Kentucky (site of the First National Treefest) will

demonstrat techniques revegetating and manag establishme state in Au

It is antic 3rd Nationa be held in the Adel comprising displays, d activities a with th Vegetation. the Commu

The com Second Nat wish this success in u spread their "tree" issue available to community.

Database used to assess wheat nitrogen deficiency

Identifying nitrogen deficiency and nitrogen responsive crops is part of the Harden Murrumburrah Landcare Farming Systems Database way of monitoring crop growth and potential yield of wheat crops.

Estimating crop fertiliser nitrogen requirements relies on assessing soil nitrate carryover and the release rates of nitrogen from the soil's organic reserves.

Pivot have put the sap-nitrate test into a commercial package and made this available to participants in the Landcare Survey.

Reid Fertilizers have donated this information to farmers and will offer the service each Tuesday morning between 9-12.

Participants are required to take approximately 40 full wheat plants starting at the three leaf stage for an instant sap-nitrate test. Pivot determine the nitrate concentration in the plant sap.

If the plant sap-nitrate concentration is above the level required to achieve the nominated target yield then nitrogen is considered not to be a limiting facto to attain target yield.

Conversely if the sap nitrate concentration is below what is required for a nominated target yield then nitrogen is a limiting factor and topdressed nitrogen may be recommended.

This sap nitrate testing provides a simple, on the spot test to monitor crop nitrogen nutrition thus assisting the farmer to make a better more informed decision on crop nutrition. This test may also be used to monitor canola and barley.

Nitrogen deficiency is one of the main causes of reduced crop yields and poor grain proteins in the cropping areas of South East Australia. Sap Nitrate testing is a management tool that enables farmers to confidently apply nitrogen at critical times in the growing period.

This tool takes the guesswork out of assessing the potential of the crop and provides a recommendation as to the most profitable rate of nitrogen to apply to achieve a nominated yield.

—Contributed.

● Colin Reid and Pat O'Connor look on as territory manager Brian Walsh conducted sap-nitrate tests at a field day outside Harden.

Coming Event

Harden Murrumburrah Landcare

Field Inspection No. 3

Thursday, September 1

8.30am.

Down Linden road, turn right at single silo, follow the lane.

TOPIC — Tillering — Weeds

Martin Stapper, CSIRO, discussing stages of wheat growth and development.

All welcome.

Further information L. Hufton (063) 868218.

EXPRESS 30/3/95

Information flowing in for wheat crop database

Landcare members are establish a wheat cropping database covering Harden and outlying areas.

Chairman of Harden Murrumburrah Landcare Peter Holding has congratulated participants involved and who have contributed to the database.

"The database has 68 paddocks entered," representing approximately a 97 per cent return in surveys," he said.

Citing the drought as causing main differences between crops, Mr Holding believes rainfall would still not have alleviated a difference in yields.

The main factors causing the variation have been attributed to sowing times, rotation and lime or pH levels.

According to the survey, yields fell by 3kg/day for every day sowing was delayed.

"Crops sown prior to the break in early June yielded 2.002t/ha compared with 1.31t/ha for crops sown after the break."

Crop rotation also affected yields.

Wheat after canola yielded an average of 1.8/ha, wheat after lupins 1.5/ha, wheat after oats 1.3t/ha and wheat after wheat 1.3t/ha.

"It is interesting that wheat after oats is not providing an adequate break crop," said Mr Holding.

The survey also showed that an average of 0.5t/ha benefit was achieved by applying lime.

"The nitrogen story was also of interest because yields were so low a lot of nitrogen was not used."

"However, additional nitrogen didn't tend to hay off crops as might be expected with high nitrogen crops being no worse than crops without added nitrogen."

Sowing rates, according to the collected data, had neither positive or negative effects on the final yield.

Mr Holding believes higher rates can be used to obtain benefits in wet years without the fear of penalty in dry years.

"The average yield was 1.587t/ha with the highest yield being 3.3t/ha and the lowest 0.36t/ha."

"One problem we had this year with the data was that most contributors gave us the data for their best paddocks."

"As a consequence the data doesn't have enough bad paddocks to properly analysis the reasons for crop failures," said Mr Holding.

In the future, the group would hope to receive data from both good and bad paddocks so that as more substantial result could be obtained.

The results of the survey although only preliminary, will be analyzed by the CSIRO before a formal report will be tabled in June and then on an annual basis.

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Chairman explains the changing Landcare role

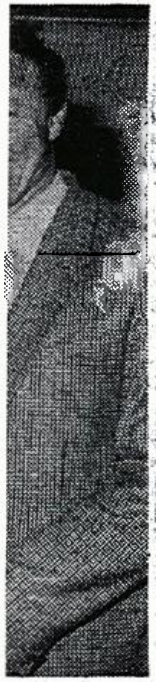
Involved since its inception in 1990, Peter Holding has been related

forestry and pasture work. According to Mr

cropping productivity across the Shire.

workload across the community."

EXPRESS 11/95



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THE LAND 21/12/95

'Playing God' in drought

By JOHN COLE

FALLOW management and rotation — factors under the control of farmers — have emerged as critical components in crop performance during a drought year.

Sowing early in basalt soils also appeared to have advantages according to a study of South West Slopes drought crops in 1994.

While growing season rainfall is obviously the key determinant of crop performance, the study showed farmers can "play God" with their crop's potential.

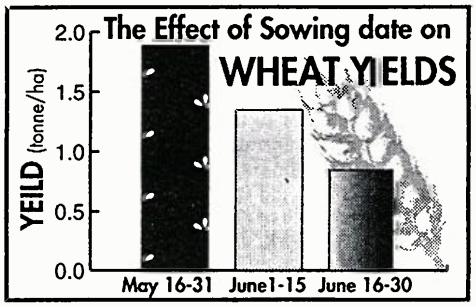
Importantly, it indicated that even in a drought year farmers can still make decisions that make the difference between a crop failing, breaking even or turning a profit.

The study was initiated by the Harden Murrumburrah Landcare Group, examining 65 wheat crops and intensively monitoring 13 blocks.

It showed decisions farmers make prior to planting can provide them with sound programs to overcome drought.

A wheat crop and rotational program can be prepared with provision for a dry season, without significantly handicapping the crop in normal or above average rainfall years.

The average yield from the study group was 1.59 tonnes a hectare (range 0.75-2.6) from an average district rainfall of 360 millimetres in 1994 (median 530mm).



A report from the study, written by Justin Hughes of the Centre for Conservation Farming (now NSW Agriculture at Deniliquin), identified key factors in a drought year.

Specifically, sowing date and fallow management contributed to above average yields for the 1994 drought year.

Soil type also contributed to better use of the rainfall. Sowing rates, soil pH, altitude and wheat variety had little or no impact.

Mr Hughes said there was a correlation between wheat yields and water use and his report spells out several measures to maximise water use.

"The first and most obvious way is to sow crops early," he said.

"Crops sown later were shown to yield less, and it is likely that this is because later sown crops will use less water than early sown crops.

"For every day after (sowing date of) May 15 an average yield reduction of 34kg/ha was observable. This relates to a reduction of $31 a hectare a week for every week after May 15 where the sowing date is delayed (based on a wheat price of $130 a tonne)."

Mr Hughes pointed to other cultivable measures farmers could adopt to maximise water use.

He said increasing the water retained after summer rain may allow earlier sowing as well as increasing total plant water use.

"Stubble retention, direct drilling and chemical weed control may assist in reducing losses of water through transpiration and run off," he wrote.

The dry year also highlighted the relative performance of various soil types, with average yield of crops on basalt soils about 1.1t/ha higher than crops grown on granite soils.

In 1994, the additional water stored by the basalt soils during the fallow (an additional 75mm at sowing) contributed an extra 1.16t/ha to yield and allowed an earlier seeding date.

There was a trend towards higher yields in crops following canola, with lower yields following lupins and lowest yields following oats. But the drought, and the performance of the paddocks in the previous year, made the variation "statistically insignificant".

The work was funded by the National Landcare Program, and conducted by Charles Sturt University's Centre for Conservation Farming.

HAREN EXPRESS 16/12/95

Office management

SIR: This letter is aimed at advantages of computerising

Tour by MCMC: role of committee explained

Harden Landcare members Louise Hufton and Peter Holding flanked by CSIRO scientists John Angus and John Kirkegaard, whose booklet Research for Profitable and Sustainable Cropping was launched in the Harden district on Monday.

Representatives of the Murrumbidgee Catchment Management Committee (MCMC) were given their first tour of the Harden Landcare district on Monday and Tuesday.

"We have a role in prioritising applications for Landcare funding," said deputy MCMC chairman Peter Millikan.

"It's through tours like this we try to get a handle on the problems facing the catchment.

"And acid soils stand out on their own in this country. They are your biggest problem and stem from a whole host of causes.

"I don't think you can point the bone at anything in particular."

Mr Millikan was of the 20 strong MCMC party which included senior officials from a number of government agencies.

Their tour of the region began with an inspection of acid soils and pasture establishment at George and Jim Elliot's Balgalal property.

An inspection of the Galong Crossroads project at Neil McColl's Bobbara Station was then followed by lunch at Mal and Louise Hufton's Naranghi residence.

Department of Land and Water Conservation representative Richard Goode supervised an inspection of gully erosion at Jugiong Creek.

That was followed by three more property tours — Peter and Julie O'Connor's Granite View ostrich farm, Stan Hume's Colenso establishment and at Warringham (Ellis Murphy).

"It's not just about coming here and sitting down with a business paper. It's more about bringing people together and getting out and communicating," Mr Millikan said.

"That's one of the big advantages of tours like this and why I really like these days.

"We get the chance transfer knowledge but it's in the local situation.

"Catchment gullies like Harden are turning out to be very significant sources of nutrients for the river. Much more significant than we initially realised."

The MCMC is Harden's, and other Landcare communities, link with the government and it provides a forum for resolving resource management issues.

The closest an MCMC tour had come to Harden before this week was when one met in Yass more than five years ago.

Tuesday, the second day of the meeting, was taken up by talks on land and water management plans and a presentation on landscape observations by explorers and early settlers.

There was also discussions on the implications of budget cuts to NSW Agriculture...

EXPRESS 2/5/96

Harden Murrumburrah

EXPRESS 2/5/96

Book launch during Harden tour of MCMC

Research for Sustainable and Profitable Cropping — a CSIRO booklet three years in the making — was launched at Ellis Murphy's Warringham property, near Galong, on Monday.

Two of the booklet's authors, John Kirkegaard and John Angus, used the Murrumbidgee Catchment Management Committee's Harden tour as an opportunity to launch their research.

"It's appropriate we are here as a whole catchment here today because most of this research had been done on a systems basis," Mr Kirkegaard said.

"This booklet is a guide to raising profits and preventing Australia's land degradation problems which currently cost $2 billion a year.

"The main message for farmers is to rotate cereals with break crops, reduce cultivation and retain stubble.

"All of this will result in more sustainable and profitable cropping systems.

Peter Holding, who has just been succeeded by Neil McColl as president of Harden Landcare, was particularly satisfied with the research methods used by the CSIRO scientists.

His Sunnyside property was actually used to test the benefits of reduced tillage and direct drilling with modified points.

"The researchers were courageous enough to open themselves to criticism and debate," he said.

"We had all the players involved on the ground level.

"It has allowed the farmers to understand where the researchers are coming from.

"The research is being launched here today but most of our members would already know what it contains.

"It's really important the work these people have done is recognised."

What have become known as "the three Rs" form the basis of the research.

They are rotating crops, reducing tillage and retaining stubble.

The study found, for example, wheat grown after canola yielded 21 percent more than when wheat was grown after wheat.

And grain protein increased by an average 1.3 percent in 14 on farm experiments.

The extra production is due to a healthier root system that increases early vigour and improves the uptake of water and nutrients.

John Betts (Yass), Christine Ferguson (Gundagai), John McGrath (Kingsvale) and Virginia Rawling (Murrumbateman) were members of the Murrumbidgee Catchment Management Committee which toured the Harden region this week.

EXPRESS 9/5/96

RAPT officially launched

Prograze seminars

Prograze is again being offered to farmers keen to establish a program which identifies the best possible

CSIRO guides point the way to sustainable practices

AFTER 5 years intensive collaboration with farmers, scientists Dr. John Angus and Dr. John Kirkegaard and a team of researchers from the CSIRO Plant Industry Division, in conjunction with NSW Agriculture and the NSW Department of Land and Water Conservation, have produced a booklet which will be of immense value to crop growers.

The booklet 'Research for Profitable and Sustainable Cropping' was launched at a field day/meeting of the Murrumbidgee Catchment Management Committee and local Landcare members at "Warringhaun" near Harden on April 29th.

Peter Holding, the immediate past Chair of the Harden Landcare Group, introduced the two CSIRO researchers, commenting that they and their team had allowed themselves to be open to criticism by, and debate with, farmers with all involved discussing what the outcomes should be. As a result, he said, the research was "more tightly done and in accordance with the farmers' expectations, with both parties speaking the same language".

In the introduction to the Booklet, John Radcliffe, Director of the CSIRO Institute of Plant Production and Processing writes, "Land degradation is estimated to cost Australia $2 billion every year.

"Our productive cropping land is at risk from acidification, waterlogging and soil compaction as well as the more dramatic damage caused by erosion and salinisation.

"Current approaches to solve these problems are expensive. At a time of low farm returns, many landholders are not in a position to invest in conservation cropping if it does not provide a quick payoff."

Dr John Angus, Mrs Louise Hufton and Mr Peter Holding from Harden Landcare group, and Dr John Kirkegaard at the launch of the CSIRO guide to Profitable and Sustainable Cropping

Dr Radcliffe said the Land and Water Care program of the CSIRO was based on farm using standard farming methods as a starting point, using departmental recommendations for weed and pest control and standard farm machinery.

The major experiments were in the Temora and Harden districts of southern NSW.

These experiments focused on crop rotations, tillage and residue management.

Extensive soil investigations have made the findings more applicable to much of the red and red-brown earth cropping soils of southern NSW and northern Victoria.

A second guide, "Productivity and Sustainability from Managing Soil Structure" presents further results of the program.

The following recommendations are made in the guide:

- Whenever possible, grow break crops (e.g. oilseed and grain legumes - in preference to grain oats - to increase the yields and the protein content of subsequent cereal crops.
- Break crops should be grown for their environmental benefits. The vigorous cereals grown after break crops extract more water and nitrogen from the soil and so reduce the potential for salinity, acidification and run-off. (Break crops are those species that break the life-cycle of cereal root diseases).
- Retain the stubble of break crops because it protects the soil surface from erosion, presents little obstacle for direct drilling and does not carry cereal leaf disease.
- Retain cereal stubble for as long as possible in the autumn, particularly where it is important to store water in the soil.

However, reduce the amount of stubble before sowing because stubble-borne diseases and toxins reduce seedling growth.

- Reduce the number of cultivations prior to sowing and avoid cultivating dry soil.
- Adopt direct drilling only after considering the risk factors that reduce the growth of direct-drilled seedlings.
- When direct drilling, reduce the risk of poor seedling growth by using full soil disturbance, or by sowing with narrow points modified to disturb soil below the seed.

Peter Holding of "Sunnyside", Harden comments in the guide: "adopting minimum tillage and direct drilling with modified points has reduced our annual tractor hours from 1,200 to 300 in ten years, while our cropped areas increased 40% and soil quality improved."

For a copy of the guides: Phone John Angus on (06) 246 5095, John Kirkegaard on (06) 246 5080 or write to them c/o CSIRO Div. of Plant Technology, GPO Box 1600, Canberra ACT 2601.

Benchmarks developed for South West Slopes crops

By JOHN COLE

A SERIES of benchmarks for crop production on the South West Slopes is expected to provide graingrowers with many pointers to increase their winter crop yields.

The information, produced from a database complied by the Harden Murrumburrah Landcare group, highlights the yield and dollar value of management decisions for cereal, legume and canola production.

The information is expected to help farmers decide on tillage options, fertiliser use, sowing rates and depths, varietal selection and rotations, based on best practice options for the entire district.

Louise Hufton: 'A valuable exchange for farmers'.

Effectively, the database allows farmers to tap the experience of growers across the slopes region — in effect, learning from past mistakes on other farms and building on the successes of leading farmers.

The effectiveness of the scheme, and its support from local producers, is an indication of the activity and application of the district's farmers to lift sustainability and productivity (see separate story).

Harden Murrumburrah Landcare group co-ordinator, Louise Hufton, said access to the database could decide individual actions (for example, what impact a change in sowing rate was likely to have); management (the influence of rotations), or compare the relative performance of individual paddocks in a farmer's own system with the district average.

The database's first success was in determining the effect of management decisions made in the summer leading up to the drought of 1994.

Decisions on stubble management, and then on sowing date, rate and fertiliser in the dry autumn of that year, provided a series of "drought wins" for local farmers, providing valuable lessons for cropping in future dry years.

"Prior to each operation (in collecting data) the group holds a field day to discuss the operation as well as the general progress of crops," Ms Hufton said.

"In itself, that's a valuable exchange for farmers.

"The development of the database in the long-term should provide farmers with a strong indication of best practice in the district.

"It's also valuable for researchers to see where research needs to be done."

The wide network of farmers in the scheme and the strong commitment to record-keeping meant the group could be well advanced towards an on-farm quality assurance scheme for sale of grain into specialised markets.

The database relies on a series of observations made throughout the year on each participating farm.

A soil test is required each February to determine soil nutrient and pH status.

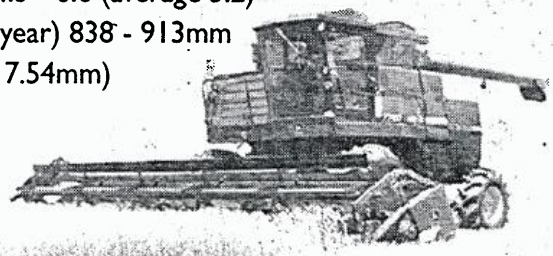
The working type and number of passes from a tillage profile for each paddock are also recorded.

Seeding depth and rate, and observations of emergence rate and plant density form the initial data are also rated. Later observations are also made for tiller count, density at flowering and a head count.

By combined yield figures and fertiliser and rainfall data with the results of deep soil tests and sap nitrate or NIR tests, a full picture of crop development and performance can be established.

HARDEN WHEAT BENCHMARKS

- Yield 5.5 - 9.7 t/ha (average 7.3 t/ha)
- Protein 10.7 - 14.1 per cent (average 11.8 per cent)
- Water Use Efficiency 25.4 - 113.2 per cent
- Soil pH 4.3 - 6.6 (average 5.2)
- Rainfall (year) 838 - 913mm (average 7.54mm)



Mutual help has rewards at Harden

THE commitment and effectiveness of the Harden-Murrumburrah Landcare Group (HMLG) have provided a notable success story for the Landcare movement.

The collective search for best practice by local farmers means advances are often made more quickly than by farmers working in isolated operations.

For a farmer considering changing sowing depth or width, the district database can provide indicators to predict the relative outcome.

Simply, it helps member farmers advance without having to "re-invent the wheel" themselves.

Interestingly, the HMLG is different to many other Landcare groups across the country.

It was not set up to solve individual catchment or district problems, like erosion on a creek line or salinity concerns.

The group's origin was based in landholders' concern about the decline in soil structure on the high yielding cropping country around Harden, the rising incidence of soil acidity, and to help research efforts for biological control of scotch thistle.

The collective efforts of the group have now been developed into a district-wide search for better farming systems.

"One of the best results of the group has been to show that sustainable farming can be also economically viable," said HMLG co-ordinator Lousie Hufton.

The database also highlighted the correlation between constant crop monitoring and better yield results for many farmers.

TODAY•TOMORROW
FARMING

Landcare link to economics

FARMERS are the best caretakers of the land. Just ask a group that is rapidly turning its Landcare base into a farmer-run extension service.

Co-ordinator of the Harden-Murrumburrah Landcare Group in southern NSW, Louise Hufton, said the group's success had come from linking land care to profitability.

"To us, landcare is farm management. To do that well you have to include the economics," she said.

FARM ACHIEVERS

Since it began in 1990 the group had grown to include 70 per cent of farmers in the area and was now in effect an extension service relying on input from members.

Vice-president of the group, Peter Holding, said landcare had to incorporate the economic and social issues. "If we fixed every creek erosion problem but then everyone left the area because they had gone broke, what's the point," he said.

At a glance

Landcare — the next step
Special feature: Fast-tracking change.
Area: Southern NSW
Reporter MEGAN BALL.

By highlighting the bottom line benefits of practices like direct drilling, stubble retention, break crops and liming there had been a significant increase in their uptake, said Peter.

The key to encouraging the uptake of sustainable agriculture practices had been a local database of wheat crops, Peter said.

"People have confidence in it because it is information they are putting in and analysing."

The database began four years ago and included everything from sowing date and paddock history to tiller counts, flowering time and yield.

Last year grain growers went one step further and had satellite imaging vegetation maps taken of the area in spring and were now investigating correlations with canola yields.

Already four years of raw data was enough to show without doubt that canola as a break crop reduced disease and weeds in the following wheat crop and improved productivity.

The database also showed the value of liming and the importance of sowing early

"The average yields have been around 3-3.5 tonnes/hectare but they have ranged from 0.5 tonnes/hectare to 6.5 tonnes/hectare," he said.

Lime sales in the district had increased three fold in the past four years. Perennial pastures, canola and minimum tillage had all significantly gained in popularity.

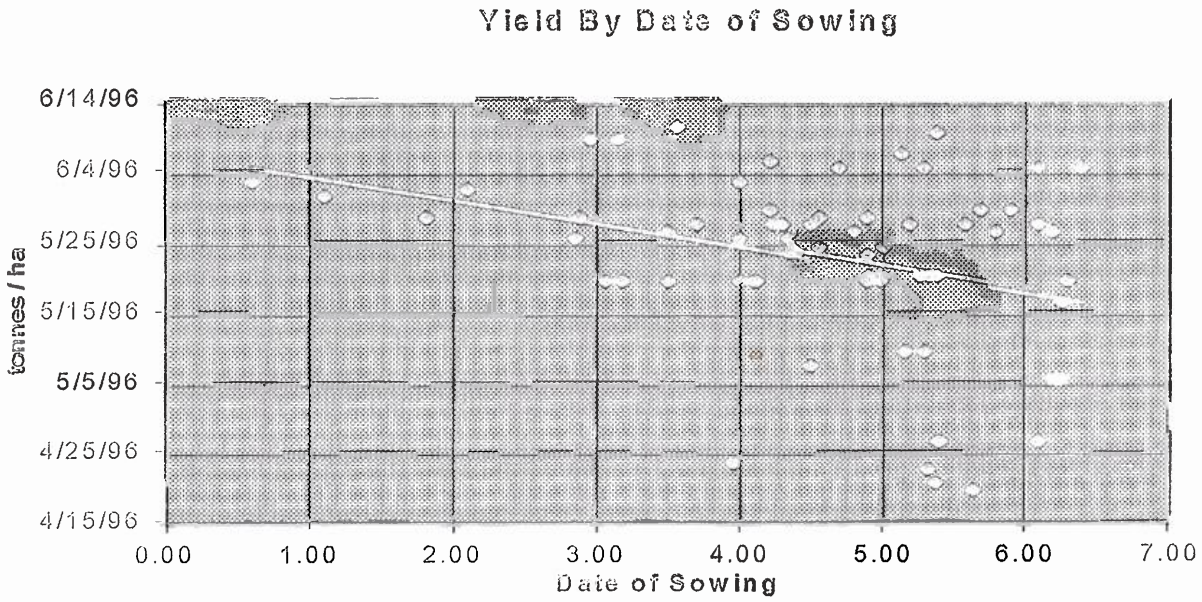
"In the past five years there has been an enormous increase in the amount of perennial pastures going in," Peter said.

Similarly direct drilling had gone from being rare to a common practice.

"A study found it takes a generation from when scientists finish their work to when it is implemented by industry. We have shortened that to five years," he said.

Map to success: Louise Hufton and Peter Holding examine satellite imaging vegetation maps.

Comments

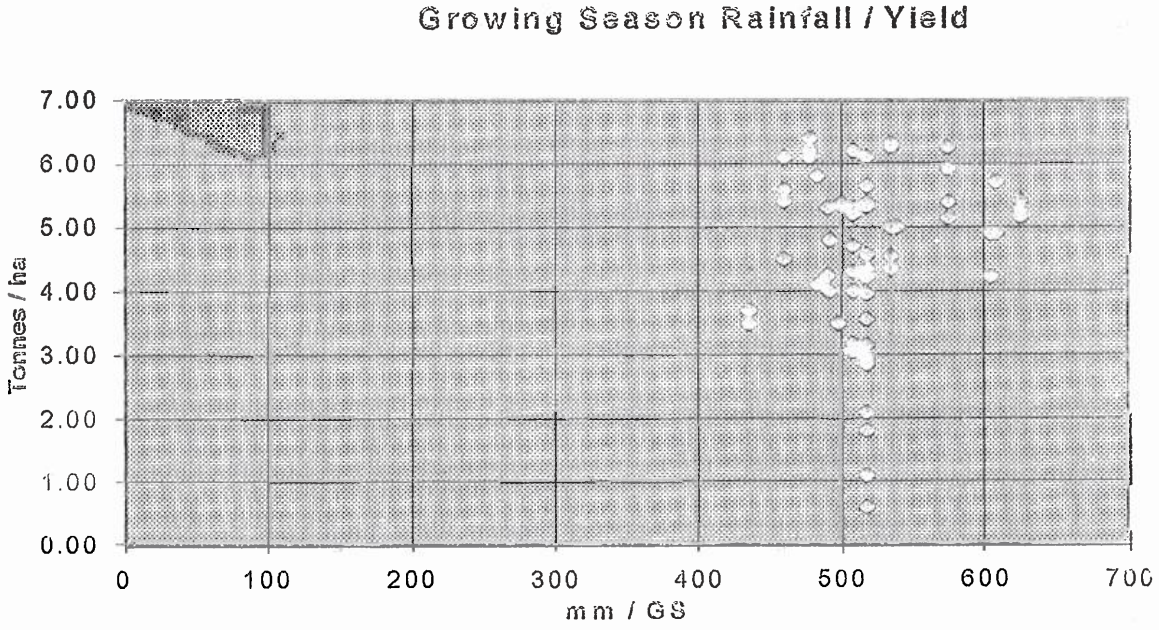


The chart indicates a relationship of the time of sowing and yield but not as strong as in previous years. There appears to be a trend of bunching of the 4 - 5 tonne ha yields in mid May. The trend line indicates that there is a penalty for sowing latter than the middle of May. This is consistent with previous years data.

Factors that may have been contributing to the variation are

- the length of the spring
- varieties other than Janz included. Eg early sown soft wheats accounting for high yields from a mid April sowing.
- area included in survey. Wallendbeen being latter sowing than Harden and east.

The long cool spring conditions allowed the late sowing penalty to be pushed out to latter in May.



The chart above clearly sows that moisture was not a limiting factor in the 1996 / 97 growing season. The close bunching of the results demonstrates that other limiting factors contributed to the spread of yields once the crop received 500 mm of GS rainfall or better. Once the GS rainfall reached 600mm some water logging may have been experienced as yields began to be affected.

EXPRESS 17/94

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It is hoped that if four or more landholders in an area of the harden Shire can carry out their baiting programmes between July 4 and 15 fox numbers can be reduced significantly. Estimates of fox numbers range from one to seven foxes per square km.

The Young Board supplies two types of bait both containing 1080 as the poison. On the average size farm 50 baits would be sufficient to carry out a control programme.

It is suggested that a trail be dragged and baits placed at approximately 300m intervals depending on terrain and fencing.

Baits have to be buried to prevent their removal by birds and non target animals.

Further information may be obtained by contacting Michael Hayes or Ron Duggan at the Young Rural Lands Protection Board.

EXPRESS 28.7.94

Testing the levels

Brian Walsh, territory manager, was one of the guests at the Clearview, Harden, field day, using a Psion organiser to test sap-nitrate.

The test provided a guide for the level of fertilizers required by farmers and also helped to determine yields.

A research and development model allows the Psion to recommend urea application and has been used in over 100 studies in Victoria, South Australia and NSW.

It is new to the Harden Murrumburrah District and is regarded as a good tool to increase productivity.

● PICTURED testing were, from left, Colin Reid, Pat O'Connor and Brian Welsh.

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There is no meeting in July but, in August, Louise Hufton of Landcare will be our guest speaker. A Landcare meeting will also be held at the Bowling Club on June 16 with