4

RRA has a role to play in developed countries

Peter Ampt and Raymond Ison

· Introduction

Innovations in agricultural research and development characterised by FSR, FSR&D, FSR&E, farmer first and last models and the utilisation of RRA/agroecosystems analysis have been almost totally confined to developing countries. Despite a long established tradition of agricultural research in Australia there have been few recent innovations in research methodology other than the development of quantitative or simulation modelling (see Remenyi, 1985) and more recently an increased focus on expert systems. The international debate surrounding the conceptual validity of the 'transfer of technology' model of research and development is only beginning to be heard in this country. The debate is being fostered by farmers (e.g. Martin, Baldwin and Hutchings, 1989) and others concerned with the widening gap between research and extension and the failure of 'technology adoption' (Anderson, 1983; Johnston et al, 1983). Here we report on the first RRA conducted in Australia. We are aware that RRA has been utilised in Minnesota (Vernon Cardwell pers. comm.) and that there is increasing interest in these research approaches in the U.S. (Anon. 1989).

A two-phased RRA which could now be described as an initial exploratory and subsequent topical RRA (Conway, McCracken and Pretty, 1987) was conducted in the Forbes Shire of central western New South Wales during 1988. The basis for the RRA location and organisational context was the 1986 acquisition by the School of Crop sciences of a leased research site 15km east of Forbes. The Central West Research Unit (CWRU) was established on the site with the intention that it would be a research base for the University in the wheat/sheep belt of N.S.W. It was envisaged that a research program would be established at the unit but that increasingly, much of the research would be carried out with the collaboration of farmers on their proprieties. RRA was seen to have the potential to identify problems for research, as a means for encouraging collaboration with farmers and as a problem identification method that warranted evaluation in a developed country context.

Aims

The aims of the exploratory RRA were to:

- forge closer links between researchers and farmers involving both in the problem identification process;
- invite and encourage farmers' interest and involvement in research so that their knowledge and expertise could be utilised;
- achieve shared understanding and insights by participation in an interdisciplinary group learning process;
- obtain information from which patterns of production and likely directions for future production could be identified; and,
- identify and define the major problems as perceived by farmers and researchers and to determine possibilities for future agronomic research in the area.

Further aims were identified for the topical RRA:

- to analyse selected problems identified and translate them into relevant and feasible research or development projects;
- to involve academic staff of the School of Crop Sciences who were likely to be involved in the on-farm research programme. The aim was to ensure a

Source: RRA Notes (1989), Issue 5, pp.22–33, IIED London

united approach within the School and to improve the communication and collaboration between staff and the producers; and,
- to disseminate the information generated to research organisations and the relevant Rural Industry Councils.

Methods

- Information was collected on the Forbes Shire from published sources and key individuals in the area;
- Two teams of researchers were assembled:

  A ten member team including representatives from agronomy, horticulture, soil science, animal husbandry, agricultural economics, social anthropology, social work and human ecology for an exploratory RRA undertaken in February and

  An eight member team with expertise in the fields of crop and pasture agronomy, animal husbandry, biometry and farming systems research for a topical RRA in October/November.

  Participation was by invitation (i.e. all team members were willing to participate with no financial inducement, other than covering costs during the RRA, even though many had never heard of RRA);

- Both teams attended team building workshops or were otherwise informed prior to undertaking the RRA to acquaint them with the information collected on the area and the methodology used. Particular attention was paid to the conduct of the semi-structured interview;
- The teams carried out 60 initial interviews of producers on their properties within a 30 km radius of Forbes on Feb. 15-19 and Oct. 30, 1988;
- Producers were chosen with the assistance of a number of key informants to include a wide range of properties, enterprises, and management strategies;
- Interviewers worked in pairs, which were changed each day. They began with open ended questions aimed at determining the farmers' perception of their situation, and then focused in on areas of widespread concern. The observations that researchers made whilst on farms were also of great importance to the study;
- Each day the teams would meet to share their experiences and to focus on areas of concern which emerged during the course of the interviews;
- At the end of the February RRA the team collaborated to document the issues of importance. An initial report was then prepared for presentation to the head of the School of Crop Sciences. Other copies were circulated for further comment to the members of the RRA team, some of the participating farmers and other interested people in the Forbes Shire;
- Following the initial interviews, the October/November team collaborated to decide on the particular agronomic problems to be pursued at more depth, and the appropriate approach for the repeat interviews;
- Thirteen farmers were revisited for a repeat interview. This enabled the team to focus in more detail on the problems identified during the initial interviews and collect more specific, relevant information for further analysis. Farmers for repeat interviews were chosen for some or all of the following reasons:

  they viewed the problems identified by the February RRA as being important in their initial interview;

  they were recognised by other farmers as being leading farmers;

  they had expressed interest in participating in on-farm research in collaboration with researchers;

- Following the interviews, the team discussed the information received and organised it into principal problems and their ramifications. Factors causing or contributing to the problems were discussed and promising areas of research were tentatively formulated, either to further define the problems or to test possible improvements;
- The team again discussed the findings of the interviews in the light of the feedback

Source: RRA Notes (1989), Issue 5, pp.22–33, IIED London

from the meeting. Their comments on the process and content of the RRA were elicited; and,

- Finally, a further report was prepared after the topical RRA for circulation to the participating farmers, team members, the School of Crop Sciences, NSW Agriculture and Fisheries personnel, Rural Industry Research Councils (RIRC) and other interested parties.

Results

Team members offered several ways of interpreting the large amount of data and the varied experiences resulting from the interviews. One approach was to describe the farming systems based on agricultural landuse: e.g. irrigated vs. dryland; crop and pasture types; soil types etc. An important distinction between 'graziers' and 'farmers' which affected agricultural lands became apparent.

A second approach was to describe the farming systems based on the management structure. A model of the family structures which were involved in farming in the Forbes Shire and some generalisations concerning the advantages and disadvantages of each structure were put forward by the social anthropologist and other team members.

A third approach was to share and collate insights of team members Those aspects of particular relevance were:

- Even taking into account the desire to obtain a sample of respondents which represented the full range of producers, the team was struck by the diversity in people, properties, enterprises and practices;
- A dynamism and acceptance of change was exhibited by producers. Whilst many would not consider major changes to their farming operations, they had nonetheless evolved a system flexible enough to undergo internal change;
- There were three broad management strategies evident in the district. Possibly the most successful and most common strategy was to make gradual and conservative adjustments to production rather than dramatic changes or to remain static;
- Producers viewed themselves as either graziers or farmers, and true integration was rare. This distinction was determined largely by social factors and had marked effects on their management strategies; and,
- The management structure of the property had a marked effect on its performance. The important determining factors were the possibility of conflict between and within generations and the level of demand for capital from the family group governed by factors completely separate from the technical demands of the property.

During the interviews producers spoke of a number of specific technological, including agronomic, problems. In addition, the team members, both individually and in groups, suggested what seemed to them to be important problems and opportunities for research.

Problems identified by producers

The six problem areas listed below were the most frequent identified by producers; many other problems were identified by just one or two producers. The problems included:

The residual effects of herbicides

There was widespread concern about the long and short-term effects of the use of various herbicides in the cropping phase (approx. 33% of those interviewed). Of particular concern was the residual effect of herbicides on the pasture phase following cropping. It was suspected by many producers (about 20%) that the herbicides retarded the establishment of clovers and/or virtually eliminated native grasses in some areas. In addition, about 20% of producers expressed a more general concern for the potential long-term damage to the environment caused by herbicides and other pesticides.

The same producers saw herbicides as an essential factor at present in ensuring

Source: RRA Notes (1989), Issue 5, pp.22–33, IIED London

profitable crops. However, they would use alternative strategies if they were available.

The application of nitrogen fertilisers

The determination of the correct rates and the optimal timing of N fertilisers on crops was of concern to at least 20% of the producers interviewed. A large number of strategies for the use of N fertilisers were encountered, including soil testing, use of paddock records, standard rates every year, only applying when cash available or intuitively based on many factors.

The lack of consensus in nitrogen use strategies indicated to the team that the optimum approach was not evident. Many producers expressed interest in participating in trials to determine the optimum timing and rate of N fertilisation and the effect of legume crops on fertiliser requirements.

Soil problems

The most frequently mentioned soil problems were crusting (15%) and compaction (16%). There was interest in the use of gypsum to ameliorate these problems, although some doubted the economy of its use. Many producers were interested in the likely effects on the soil of the use of legume crops in the rotation. Of particular interest to some was the optimal method for handling the stubble.

Erosion problems were mentioned by 7% of producers, as were problems associated with the considerable variability between soils even in the one paddock. There was a general perception that soil degradation was not occurring provided that an adequate rotation was being maintained. However, many producers pointed out that others were 'flogging' the soil and then selling the property in a degraded state.

Wheat varieties and diseases

There was a perception by a number of producers that there were deficiencies in many of the recommended wheat varieties (also oats to a more limited extent). The most common criticisms were:

- the poor germination of the dwarf and semi-dwarf varieties;
- the poor quality of the stubble produced, as indicated by the poor performance of stock on new varieties in comparison to the old; and,
- the lower protein content of the grain of new varieties.

Pasture varieties and establishment

There was widespread concern about pasture management and establishment (about 30%). Some producers were interested in new legume varieties (14%) and in investigating establishment methods to improve their pastures. The loss of native grasses was noted by about 5%, and the need for suitable replacement grasses, particularly perennials was perceived.

The establishment of trees

About 10% of producers felt that their area had been overcleared and that a tree planting programme was required. A smaller number had undertaken some form of tree planting with variable success.

Problems identified by the team

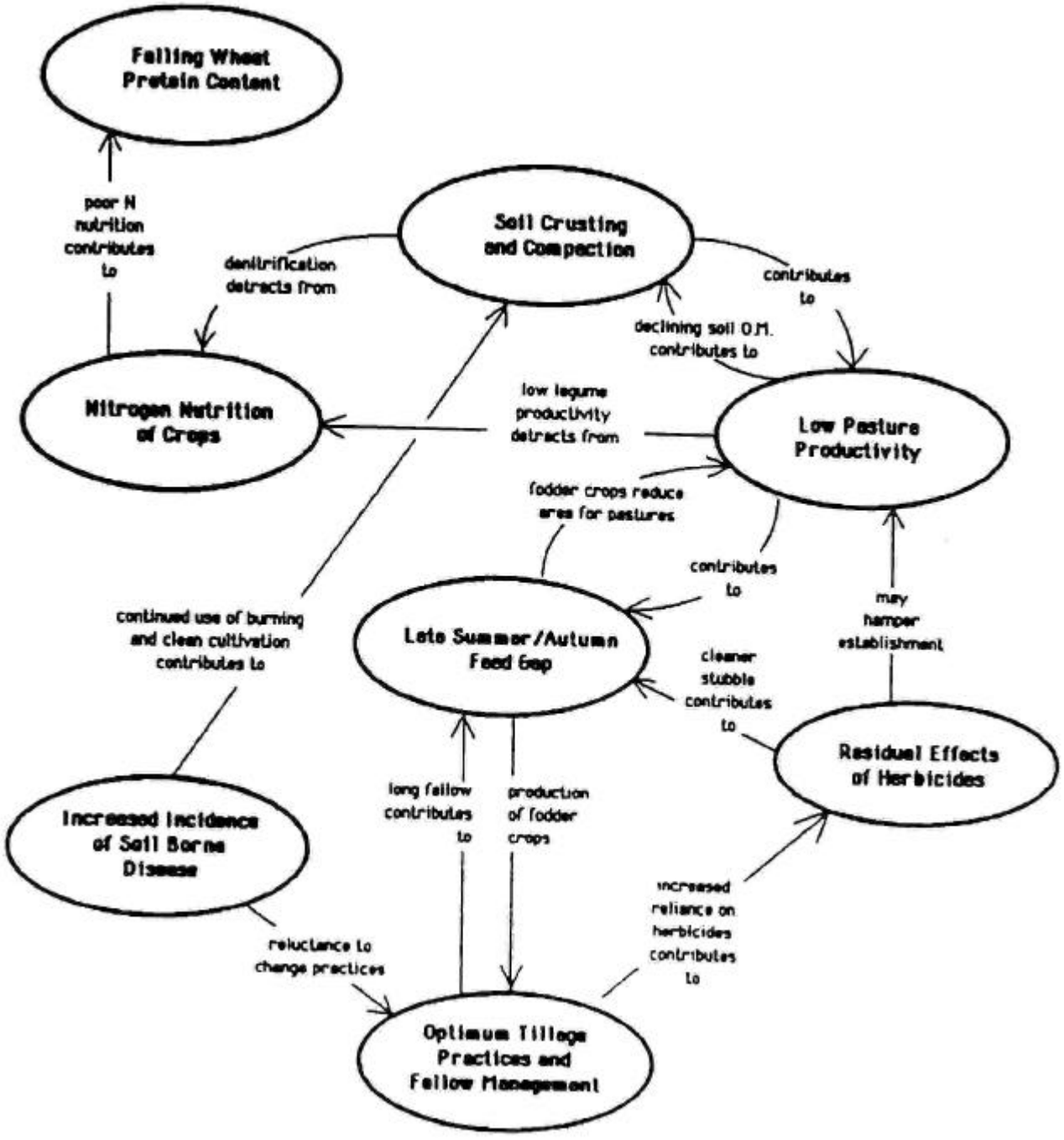
The following problems and related research opportunities became apparent to members of the team, although they were not necessarily perceived as problems by the producers:

The late summer/autumn feed gap

At the time of the first interviews (mid February) most producers were hand-feeding their stock. In fact it is a routine practice in most years to overcome a lack of feed in late summer and autumn. The producers did not perceive this as a problem, possibly because it seemed to be accepted as a 'fact of life' in the district. Members of the interviewing team felt, however, that there were many, possible avenues which could lead to greater feed availability at that time of year. This was investigated in greater depth in the topical RRA when the links between agronomic problems became more apparent (Figure 1).

Source: RRA Notes (1989), Issue 5, pp.22–33, IIED London

Figure 1. Links between agronomic problems identified during the conduct of a topical rapid rural appraisal.



It was evident to team members that at least some of these problems were not new, and that information which would enable them to be alleviated was already available. This indicated that there was a communication gap between researchers and producers and added weight to the argument that the traditional research-extension-producer model for the transfer of technology had not been successful in achieving adequate awareness or adoption of new technology or alternatively the technology was inappropriate to producers.

Source: RRA Notes (1989), Issue 5, pp.22–33, IIED London

Tillage practices and moisture conservation

A widespread practice in the area is to establish a long fallow in late spring and to rework it after rain. The rationale given for this was the conservation of moisture. However, problems with soil crusting, poor infiltration and compaction were identified by farmers. In addition, the silting of dams and the prevalence of dust storms points to some degree of soil erosion, possibly due to overworking the soil. It was by no means obvious that cultivating would necessarily conserve moisture.

Other issues included the appropriateness of soil test kits; limited experience of producers with pasture establishment and management; and soil variability at the paddock, farm and Shire level.

· Conclusions

A number of conclusions/action strategies which arose from this two-phased RRA are summarised:

- The School of Crop Sciences will continue to develop its collaborative on-farm research program due to the enthusiasm from the producers and the prospects for improvements. The School could also play a role as the instigator of an interdisciplinary and multi-institutional research program involving NSW Agriculture and Fisheries. Expressions of interest have already been received.
- The School of Crop Sciences is to make available an annotated list of producers who have been involved and have expressed an interest in being included in ongoing research on particular aspects of the problems described. This will enable other research and development organisations to utilise these producers' knowledge and resources.
- The School will seek further funding to appoint a co-ordinator/ researcher with experience in farming systems research methodologies, to organise an integrated program with a number of component projects. This role could possibly be undertaken by staff members of a Rural Industry Research Council (RIRC). It would be essential, however, that an on-site coordinator be appointed to maintain continuity of contact with producers once projects were under way. These duties may be performed by one full-time or two part-time people.
- The information generated by this RRA has been made available to the relevant RIRCs so that it might be taken into account when determining their priorities for funding projects and in their pro-active role in encouraging or contracting out research according to their priorities. One RIRC has commissioned a review of the conceptual basis of Australian extension, drawing on national and international developments. Three members of the RRA team are involved in the conduct of this review.
- The RRA methodology will be used in future to monitor and evaluate the progress of the research and to provide ongoing identification of further problems and opportunities as they arise.

Whilst further evaluation of the RRA methodology is still in progress, it is clear that it has advantages over other survey methodologies (such as questionnaire surveys) or informal contacts and tours by individuals or small disciplinary groups. The following advantages of RRA were evident in this case:

- It provides researcher participants with a far wider range of contacts within the farming community and a firmer understanding of the social, economic, political and biological context in which research is undertaken. It is an extremely rich learning experience.
- It has opened avenues for ongoing collaborative research with producers.
- It has been successful not only in identifying, but also in analysing and defining a wide range of problems.
- It has brought a number of producers together, thus stimulating informal farmer to farmer interaction and learning.
- It has raised the profile of the School of Crop Sciences in the Shire and communicated to farmers the nature of the School's commitment in establishing the CWRU and its existing research program.

Source: RRA Notes (1989), Issue 5, pp.22–33, IIED London

In addition to these advantages, there have been a number of activities instigated as a consequence of the RRA. These are summarised below:

- The team members of the February RRA have been trained in the use of the methodology and a number of them have undertaken RRAs for other purposes, e.g. in a study of the poultry industry and in a soil conservation/sustainable agriculture project.
- The use of information and insights gained during the RRA has led to the instigation of a collaborative project to study inheritance and inter-generational transfer in rural communities.
- The generation of the notion that enthusiasm is a higher order concept than the team's initial perception that farmers could be labelled as 'information rich' or 'information poor' is being further developed in a collaborative paper and as the foundation of a review of the conceptual basis of extension. The basis of this insight was that people who were 'enthusiastic' appeared more able to manage their own realities and to accommodate change. A key strategy was thus seen to be generating enthusiasm in people for who they are and what they are doing, working on the belief that all people are information rich and are capable of making the best sense of their realities.

Limitations of the study

The first Australian RRA has given rise to all of the above activities and an original assumption, that manly of the problems that have been evident in developing countries are also evident in developed countries, has been born out in the findings. Yet there is still a long way to go before RRA is likely to be implemented on a wider scale in this country. Research and development remains strongly discipline and commodity bound with little evidence of many people involved in the rural research 'industry' perceiving the need to make the 'frame shift' from the 'transfer of technology' based approach to 'farming systems research' or 'farmer first and last' approaches. Should these approaches fail to be institutionalised in developed countries then there are bound to be continuing reservations on the part of donor agencies and agricultural ministries in developing countries as indicated by Frankenberger et al 1989) for FSR/E.

In respect of our study the next step would appear to be to encourage people in positions of power and influence within the system to become personally involved in one or a number of future RRAs. The selection of team members was certainly one of the major limitations of this study, in that many of those involved had an initial knowledge of, and interest in, FSR and RRA and so their learning tended to be a reinforcement of views already held rather than 'revelations'. However, a number of the team members who were self-confessed 'hard-nosed' reductionist scientists did say that their eyes had been opened to the complexity of the producers' decision-making environment. This had helped them to see why new technologies were not always readily adopted. Thus if senior administrators from research funding bodies and research organisations in this country could be persuaded to be involved, they may also undergo a similar learning process.

In addition, this two stage RRA did not actively involve farmers as members of the team. They were included in the decision-making to a small degree with the meeting held during the second or 'topical' RRA. It was debated initially whether to include farmers on the team but it was decided not to invite them on the strength of research done in this country showing closed communication networks amongst groups of farmers (Anderson, 1984). An alternative strategy to this could have been to invite producer participation with acknowledgement of the possible problems and to see if they did in fact arise. Thus the RRA could have become more of a unifying force in the district, rather than accepting farmer networks as an immovable obstacle.

Another limitation of the study was that the interviews and analysis were undertaken prior to our access to recent developments in ranking methods (Pretty et al 1988), sustainability analysis (Craig, 1988) and agricultural triage (Craig and Sukapong,

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1988). These tools may have enhanced both our consolidation of the data collected and the themes and hypotheses generated.

- **Peter Ampt** and **Raymond Ison**, School of Crop Sciences University of Sydney Australia, 2006.

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