THE TRADE-OFF BETWEEN AGRONOMIC ADVICE AND RISK MANAGEMENT STRATEGIES FOR PLANTING DECISIONS IN THE DARLING DOWNS GRAINS REGION OF AUSTRALIA

Toni Darbas and David Lawrence
The Trade-off between Agronomic Advice and Risk Management Strategies for Planting Decisions in the Darling Downs Grains Region of Australia

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ABSTRACT

A decade of sustained research, development and extension (RD&E) effort was undertaken in Southern Queensland’s broad acre cropping zone. Whether and how the resulting insights into stored soil water were integrated into the planting decisions of grain producers was, however, brought into question when a series of dry years culminated in widespread wheat crop failure across Southern Queensland’s Darling Downs in the winter of 2007. This paper reports on a qualitative investigation into the use of stored soil water research in planting decisions in this cropping region of Australia. A dual sample of grain producer and agronomic RD&E advisors were interviewed in-depth in order to establish what planting strategies were used by grain producers and to explore the relationship between these strategies and agronomic advice. We found that all of the interviewees understood the role of stored soil water in crop performance. However, this understanding supported three distinct planting decision strategies: plant only when a stored soil water threshold has been reached; take the opportunity to plant at least some crop each season; and plant at the appropriate time to maximise crop yield and consider stored soil water a bonus. These planting strategies were perceived by the interviewees to be aligned to agronomic advice differentiated by its commercial terms. Private agronomists, hired via an annual retainer, tended to be associated with the first planting strategy while retail agronomists, hired through the purchase of chemicals, were perceived as associated with the second strategy. These results indicate that an industry wide comparison of planting strategies in terms of yield outcomes and economic performance over multiple years is warranted in order to facilitate industry wide discussion of the trade-offs between long term enterprise profitability and short term economic pressures.

Keywords: systems, dryland grain farming, soil water, risk, extension

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INTRODUCTION

The ability to produce grain in dry lands is contingent upon the ability of grain producers to harvest rain. The erratic rainfall patterns typical of highly variable climates such as that found in Australia make the storage of water in soil a crucial variable for farmers to consider in profitable grain production. For this reason, sustained research, development and extension (RD&E) effort was undertaken over a decade in Southern Queensland’s broad acre cropping zone. This publicly funded RD&E effort sought to deepen understanding of soil water storage by both grain producers and the agronomists providing advice to them (Freebairn et al., 2009; Carberry et al., 2002; Dalgleish et al., 2009). Due to reduced availability of funding, this concerted RD&E effort has since tapered off in Southern Queensland. It was assumed that the existing commercial agronomic sector, an integral component of the RD&E sector, would provide ongoing extension on purely production matters to grain producers (Stone, 2005) and thus take over the advisory role regarding stored soil water and planting decisions from public agencies. However, this assumption was brought into question when a series of dry years culminated in widespread wheat crop failure across Southern Queensland’s Darling Downs in the winter of 2007. This event raised two questions. The first being how grain growers factored their stored soil water levels into their decision whether or not to plant their crops. The second question concerned what role commercial agronomists played in such decision making.

The rise of neo-liberal policy settings for Australian agriculture, and attendant rejection of protectionist agricultural policy is contextually relevant to these questions. This policy shift has had a structural effect upon both the system of grain production and the RD&E system that services grain production over the past three
decades. Three factors are now standard in explaining the rise of neo-liberal agricultural policy settings: the reduced contribution of agriculture to Gross Domestic Product; Australia’s high degree of urbanisation; and increasing orientation to global agricultural commodity markets (Gray and Lawrence, 2001; Lawrence, 2005; Bjorkhaug and Richards, 2008). These factors have driven the loss of agriculture’s exceptionalist status in national consciousness and policy. The mechanism by which the transition from protectionist policy settings to neo-liberal settings has been achieved is the Rural Adjustment Scheme created in 1977 under a Liberal (conservative) Government and extensively restructured in 1988 by a Labor Government. The Rural Adjustment Scheme assists farmers to either become competitive on global commodity markets by targeting their managerial skill, or to exit agriculture altogether (Higgins, 1999). Under these settings, the farming communities are becoming increasingly differentiated. Successful producers have expanded and capitalised to maintain their competitive position; producers located in high amenity or near urban areas have the option of profitable exit by subdividing and selling properties as rural residential lifestyle blocks; and a “large majority of farm families” increasingly rely on off-farm income in order to continue farming (Alston, 2007:19).

Part and parcel of this shift to neoliberal policy settings, reductions in public expenditure for agricultural RD&E have occurred across the globe (Van Crowder, 1987; Read and Quinn, 1988; Rivera and Gustafson, 1991; Kidd et al., 2000). Debate concerning this reduction has been entwined with critique of the standard transfer of technology approach to extension as well as the rise of the environmental imperative in public policy (McDowell, 2001). The technology transfer approach to the E in RD&E has increasingly been dismissed as mechanistic because it fails to
translate awareness of new research findings and technologies into understanding and practice change, or to transcend community barriers to achieving practice change (Russell et al., 1989). This limitation has created debate amongst RD&E agencies and funding bodies about the role and effectiveness of extension, and agricultural RD&E in general (Mullen et al., 2000). Secondly, the rise of the environmental imperative has made extension services focused on agricultural production so delivering a ‘private’ benefit, rather than a public benefit such as improved natural resource management, difficult to justify (Black, 2000).

Consequently, in Queensland, the focus of government extension services has shifted from servicing individual producers through one-on-one contact (perceived as creating private benefit) to group extension focused on the impact of farming on catchments so as to ensure farming practices simultaneously enhance ecological and productivity outcomes (Wissemann, 2003:65). The Queensland RD&E system now leaves tactical advice for the purposes of profit to agronomists employed by or running agribusinesses.

Given these structural changes in both the grain production system and the RD&E system, it is opportune to inquire into the current pattern of use by grain producers of commercially available tactical advice. This paper deals with how agronomic advice to grain producers conditions the integration of soil water knowledge into planting decisions. A social systems approach was taken. Focusing on RD&E and grain production as distinct systems allows analysis of the degree of differentiation of within each system as well as the terms of engagement between

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3 In Southern Queensland, three major ‘Farming Systems’ projects have used participatory methods to coordinate activities across the main grain cropping regions so as to focus RD&E effort on issues of regional environmental importance. Building on past RD&E, these projects have concerned increasing use of zero tillage, controlled traffic and improving nitrogen management (Lawrence, 2010).

4 This research topic was chosen, and study commissioned, by the Australian Grains Research and Development Corporation’s Southern Queensland Farming Systems research steering committee, which is comprised of leading grain producers, private agronomists and researchers.
them. Grain production and agronomic RD&E are socio-economic sectors or systems in the sense that they form areas of functional specialisation. The grain production system specialises in growing grain for profit and is underpinned by the farming family unit. The agronomic RD&E system specialises in the production and application of research findings and is underpinned by the discipline of agronomy. The qualitative (in-depth interview) data gathered indicates that the formerly publicly funded RD&E investment in understanding the role of stored soil water in crop performance has resulted in widespread understanding of the role of stored soil water in crop performance within the grain production system. However, this understanding has translated into three different planting strategies. Simultaneously, the type of advice offered about the role of stored soil water in crop performance has differentiated according to the organisational context agronomists work within which determines the commercial terms on which that advice is offered.

The body of this paper is progressed through the following five sections. Section two details the methodology employed. Section three characterises the zero till farming system now predominantly used for grain production in Southern Queensland. We then discuss how three factors (return on capital investment; short term economic pressure; and the need to maintain the cropping system) effect how grain producers prioritise the role of soil water in planting decisions. This results in three distinct risk management strategies that deal with the decision whether or not to plant in a season. In Section four, we draw on the interviewees’ experiences and perceptions of the shift away from public funding of the RD&E to ascertain how retail and private agronomists’ advice regarding stored soil water is typically used by producers for their planting decisions. Section five draws out the implications of

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5 This perspective is adopted from the German social system theorist Niklas Luhmann (1982).
these analyses to consider how the current terms of engagement between grain production and RD&E systems affect the sustainability of both. We conclude in Section six by suggesting a research exercise that could drive industry wide discussion of the trade-offs between long term profitability and short term economic pressure.

METHODOLOGY

A stratified sample of key informants from both the grain production and RD&E systems was compiled with the assistance of the Southern Queensland Farming Systems Research Steering Committee. Stratification was viewed as necessary to take account of regional differences within the Darling Downs and organisational differences between agronomists providing soil water and planting advice.

The major regional differences within the cropping zone include soil capacities, enterprise types and climatic conditions. Soils with the highest water storage capacity are found on the eastern floodplains of the Darling Downs. This district is dominated by ‘elite’ cropping enterprises and has historically benefited most from former RD&E effort as it is within an hour’s drive of both RD&E agency offices in the regional city of Toowoomba and a high concentration of commercial agronomic services in the service town of Dalby. The uplands of the eastern Darling Downs do not feature such consistently deep soils, are dominated by mixed cropping and grazing enterprises, and have not enjoyed the same intensity of RD&E effort regarding the use of soil water knowledge in planting decisions. The near west Darling Downs are also dominated with cropping enterprises and like the Uplands have reasonable soils. The far west Darling Downs form the fringe of feasible cropping and are characterised by more extreme temperatures and therefore heat
and frost risks for crops. Mixed cropping and grazing enterprises are typical in the far west district.

The sample of agronomic advisor key informants was stratified according to the organisational context which determined the terms on which they provided advice to grain producers. Retail agronomists offer advice that is paid for by producers via a mark-up in the price of herbicides and fertilisers. Private agronomists are paid by producers for their advice via an annual retainer. Agency researchers and extension officers are drawn from a division of the national science agency (Commonwealth Science and Industry Research Organisation (CSIRO) Division of Sustainable Ecosystems (CSE)), two government departments of the state of Queensland (Department of Primary Industries and Department of Environment and Natural Resources) and employees of two non-statutory Natural Resource Management (NRM) Regional Bodies of Southern Queensland. Blurring between these three categories of retail, consultant and agency agronomic advisors is in large part due to the fact that these key informants had worked in two or three of these sectors.

**TABLE 1 ABOUT HERE**

In total, 43 interviews were conducted with 50 interviewees (Table 1). The interviews took around 1 hour, were transcribed and the transcripts thematically coded using the NVivo software program. The interview questions concerned: the farming system; how risk governed that system; how probabilities are calculated; the relevance and measurement of soil water; information sources; social networks used in crop production/agronomic advice; and changes in the extension system. The questions were tailored to fit the orientations of the two groups (grain producers and advisors). The questions were piloted and minor corrections made. Interviewing of
advisors was undertaken face to face and by phone. However, all grain producer interviews were undertaken on farm and face to face.

The full data set is used to characterise the grain production and the RD&E systems in the following two sections as agronomic advisors and grain producers freely commented upon each other’s domains. This mutual commentary was useful for understanding the tensions between advice and production. It also pointed us towards the specific linkages between advice and production formed by patterns of social interactions between producers (peer learning), between advisors (mentoring and professional networking) and between producers and advisors (the commercial terms of advise).

THE GRAIN PRODUCTION SYSTEM AND PLANTING STRATEGIES

Grain production on the Darling Downs of Southern Queensland is based on the rain fed cereal crops of wheat, barley and sorghum. However, other crops grown include grain legumes, such as chickpea, sunflowers and cotton. Cropping in this region is conditioned by mean annual rainfall in the range of 550-750 mm with approximately 70% of this rainfall occurring during summer. Both winter and summer crops can be grown because the region’s heavy clay soils can typically store between 100 mm and 200 mm of plant available water. Winter crops are often grown after a summer fallow period of ~6 months and summer crops after a winter fallow, to enable water and mineral nutrients to accumulate in the soil profile for use by the following crop (Thomas et al., 2007).^6^  

 Changing from winter to summer crop, or vice versa, usually results in a long fallow period of 12–15 months, or a short fallow period of only 1-3 months if soil

^6^ Although double cropping is not typical further south in the cropping zone, it is unknown how far south it ceases to be viable.
water reserves are replenished sufficiently (Thomas et al., 1997; Freebairn et al., 1998). The storage of soil water is critical for reliable grain production in the region. Indeed, a daily water balance model ‘Howleaky?’ (McClymont et al., 2006) has been used to estimate that at Dalby (the town servicing the Eastern Darling Downs Floodplains), with a mean annual rainfall of 641 mm, winter crops obtain 62% of their total water supply from stored soil moisture, while summer crops obtain only 27% (Thomas et al., 2007). Consequently, the level of stored soil water at planting is a key determinant of crop yields and profitability in the region. However, the efficiency of stored water is lowered by evaporation losses. Fallow typically store between 22% and 26% of rainfall that is then available for subsequent use by crops (Thomas et al., 2007).

Maximising grain production entails an ongoing process of learning and experimentation in response to these biophysical realities. Major changes to the grain production systems in the Darling Downs region have thus occurred over the last fifteen years. More and more diverse, summer crops are being used to increase the planting opportunities beyond traditional winter-based wheat systems. The interviews also confirmed a dramatic shift toward zero-tillage systems in the last ten years (Lawrence, 2010) along with increased use of controlled traffic systems. Zero-tillage is a system in which weed control during fallow is achieved with herbicides and the soil is no longer ploughed before planting. As one grain producer reflected:

“In ten years, (we’ve) changed probably from … 70 per cent cultivation maybe, 60 per cent cultivation, to complete zero till” (Grain Producer No. 3).

All of the RD&E interviewees supported zero-tillage systems as underpinning improvement in the profitability and sustainability of grain farming across the region. For example:
“Ten years ago of course we were into aggressive tillage, farming mainly with chisel ploughs … there wasn’t too much fallow spraying. Now virtually everyone sprays the fallow and it’s … very beneficial” (RD&E No. 10).7

The zero-tillage system was developed to maintain crop stubbles and thus protect the soil from erosion but it also has the benefit of minimising soil disturbance and improving water retention (Radford et al., 1993). Consequently the seedbed is moister which widens planting opportunity windows. Zero-tillage methods have encouraged a growing number of grain producers into controlled traffic systems, in which all farm machinery is driven along the same wheel tracks in order to reduce soil compaction and increase efficiency. While these changes entailed major capital investment in new machinery, they have dramatically increased the management options available to grain producers:

“zero till and controlled traffic … [are] two things that have … allowed double cropping and more conservation of moisture, which has made cropping frequency … better and more reliable” (RD&E No. 5).

Subsequently, new planting equipment such as disc openers have been developed to provide the ability to ‘seek moisture’ and ‘deep plant’ seed into moist soil thus allowing zero-tillage grain producers to plant for months after rain events and reducing their dependence on planting rains.

Planting opportunities arise when there is sufficient moisture in the surface of the soil to germinate a crop at a time suitable for that crops’ optimum growth given the district’s heat stress and frost risk factors. The decision to plant is simple when

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7 However, weed resistance to herbicides was considered a growing problem by interviewees and had induced some grain producers to return to strategic tillage for weed control.
stored soil water levels are high and rains falls within this window. As an interviewee explained, they would plant if:

“we had an inch of rain, historically a good time to do it, some sub-soil moisture, and then other people planting…So away you go” (Grain producer No. 3).

However, if a crop is planted on little stored soil water and in-crop rain does not prove sufficient, the failure of that crop is predictable. All of the RD&E and grain producer interviewees understood that the more stored soil water was available at planting the more reliable grain production would be. Sixteen grain producers measured soil moisture themselves, typically with soil probes. Four grain producers relied on their consultant agronomists to measure stored soil water for them. Only three producers relied on their knowledge of rainfall alone as an indicator for soil water storage.

However, while agency RD&E and private agronomists (but not retail agronomists) agreed that planting decisions should be based primarily on stored soil water levels, the grain producer interviewees highlighted a range of other factors that influenced their planting decisions:

“A large number of variables come into play… Your soil moisture’s not always being the first one at all. It’s one of the more important ones” (Grain Producer No. 2);

“[Stored soil water is] extremely important. But if I haven’t got enough stored moisture to grow a crop, that’s no reason not to plant it” (Grain Producer No. 7).
Three key influences upon planting decisions that moderate consideration of soil water were highlighted by the grain producer and RD&E interviewees: the need to achieve an adequate return on their investment of capital in the farm; maintenance of cash flow to ensure bills can be paid; and maintenance of their farming system. These three influences were experienced as pressures to plant a crop even if stored soil water levels were less than ideal and we now discuss them in turn.

Firstly, all interviewees acknowledged the need for grain producers to maintain an adequate return on their investment and having a crop in the ground was widely considered critical to maintaining such returns. As one farmer explained:

“Our properties are worth a lot of money per acre, and doing nothing doesn’t work. I’ve still got bills and things to pay, and even if I owned this thing outright, I want a return on my investment” (Grain Producer No. 2);

“You’ve got this mentality when you’ve got planting time and you don’t have any soil moisture, well what if we do get a wet winter and you don’t plant it, it’s just going to pass you by like a ship in the night” (Grain producer No. 14).

However, views on what constitutes the best planting strategy in order to maximise returns on capital investment were polarised. Thus, agency agronomists, private agronomists, and grain producers who adhered to a strict minimum stored water planting rule believed that:

“No one can afford to plant a crop and not get any income off it” (RD&E No. 5).
Secondly, cash flow was a major consideration for both grain producers and the agronomists providing advice to them. Cash is required to meet bank repayments, operational costs on the farm and living expenses,

“Well there are a certain amount of payments that need to be made through the year. If you don’t produce anything, you cannot make the payments. It’s probably 60 per cent of the reason you do what you do… to keep the bank happy. Because no matter what you do, whether you’re going to buy a new farm or whether you’re going to buy a new tractor or whether you want to open the fridge and find something in it, you’ve got to pay the bills” (Grain producer No. 7).

Subsequently, some grain producers believed stored soil water: “for a crop is very important, but for your cash flow, it probably doesn’t work” (Grain Producer No. 6). In contrast, grain producers who used a strict minimum soil water planting rule simply added expenses to their overdrafts until they received what they believed was a planting opportunity with acceptable risk levels:

“I thought nowadays you could talk to the banks and say I didn’t plant and this is the reason why I didn’t” (Grain Producer No. 1).

Agronomist views on this issue ranged with retail agronomists more sensitive and private agronomists less sensitive to short term economic pressure. Insensitivity by agronomists regarding cash flow created frustration among grain producers. Eight producers suggested that agronomists were not investing their own money and did not understand the cash flow pressures that they faced. As one producer observed, his agronomist was:
“sensitive to … cost … [and] will tell himself that he’s therefore … helping with your cash flow. But he’s not. The cash flow for the farmer is not a one hit wonder … That pressure is so much more dynamic …I have to meet that interest payment on the 1st of July, or the tractor payment or header payment, whatever it might be” (Grain Producer No. 22).

Thirdly, many grain producers also planted crops on low levels of stored water in order to maintain their farming system as a whole. Maintenance issues included: growing both summer crops and winter crops; ensuring the presence of crop stubbles to protect soil from erosion and increase infiltration by rain; and adhering to a sequence of crops to ensure long-term weed and disease control. For example:

“A lot of it comes down to a rotation type strategy. I look at a paddock and say, well no, it’s had too many sorghum crops in that. I want to get it back into a winter crop. Yeah. Stubble’s okay. Not a lot of moisture in these. But we’ll have a go…the probability of me getting a crop in any given season is 100 per cent, whether it’s a viable crop or whether it’s something that grows a bit on the ground and improves my organic matter” (Grain Producer No. 7).

It was evident from the interview data as a whole that a continuum existed in the extent to which the level of stored soil water determined the planting decision. This continuum yielded plural planting risk management strategies in varying trade-offs between long term profitability and more immediate risks (such as missing a planting opportunity and generating cash flow). Three strategies for managing the risks associated with planting under variable levels of soil water were evident. The first strategy was: *don’t plant a crop unless a threshold of stored soil water is reached*. This strategy was supported by 9 grain producers and 11 advisers (5 agency, 3 private and 3 retail agronomists). It aims to minimise crop failures by only
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growing crops with a very high chance of success. Low yielding crops are avoided on the basis that they waste resources such as stored soil water, seed, fertiliser and fuel. Articulations of this strict planting rule included:

“We’ve got to have at least 150mm of stored soil water. So we need 120cms of wet soil” (Grain producer No. 19);

“Once we get two and a half to three foot of wet soil we will plant a crop, that is our main parameter” (Grain producer No. 1).

Some interviewees restricted this strict planting rule to summer crops only as they had higher input costs and could run out of water around flowering if rainfall failed to top up stored water levels. However, other interviewees used the same logic to restrict the strict planting rule to winter on the basis that more stored water was required due to the reduced likelihood of rainfall in the growing period.

The second and most common strategy was to: take opportunities to try and plant at least some crop each season. This strategy was supported by 14 grain producers and 9 advisers (5 agency, 1 private and 3 retail agronomists) within the sample. Taking advantage of every planting opportunity was more likely to capture high prices in low yielding seasons and contributed to maintenance of their cropping system. As farmer interviewees stated;

“We operate on an opportunity cropping basis meaning if there’s moisture there whether it’s fallow or not it goes back in because we just can’t afford to not have a crop in the area” (Grain Producer No. 17);

“I’ll plant [winter crop] easily. Like, I’ll just stick seed in the ground. Doesn’t cost you a huge amount and you might dribble a bit of starter fertiliser in with it. But it’s not going anyway. If I waste the seed, well most of it I keep
myself. (It) doesn’t cost me a lot, but the benefits of jagging it and actually getting that shower of rain, getting the crop up and getting it going at the right time, possibly, outweigh the risk that you take [of] burying two tonne of seed” (Grain Producer No. 7).

Within this group risk spreading strategies were utilised. These grain producers reduced the area of crop planted to reflect the amount of stored soil water they had available:

“I work my percentage of planted acres as a percentage of soil moisture profile. So if I have half a profile, I’ll plant half my acres” (Grain Producer No. 14);

“Having a couple of feet of sub-soil moisture I would be prepared to plant everything, if I could physically get it in … With one foot of sub-soil moisture, I might … [plant] half to two-thirds of my intended acreage. And if I had only the planting rain, I’d probably only plant 20% …” (Grain Producer No. 2).

Further risk management options used included reduction in planting rates, reduction of inputs (such as fertiliser), and use of more resilient crops and varieties.

The third strategy was: plant at an appropriate time to maximise crop yield potential and consider stored soil water as a bonus. This strategy was used by 2 grain producers and 1 private agronomist. However, the strategy was included here because a significant number of grain producers in workshops conducted concurrently with this project also stated that this strategy is an emerging force in their area. This strategy aims to plant crops at their optimal time to maximise yields in the region, for example, to plant summer crops so they are growing when most of the rain falls. The advocates acknowledge that soil water will improve yields and
their reliability and they use methods such as zero-tillage and controlled traffic to maximise their stored soil water, but they believe they will be better off in the long run with this aggressive approach:

“We’ve gone beyond just storing water…to use the water that arrives you need a growing crop” (Grain Producer No. 6);

“A few of my guys now are planting by the calendar not by anything else. So they’ll check the soil moisture with probes… [it still helps]…but largely they got the system sorted out now, they can plant whenever they want to. So they look at … the maximum yield potential time and then they’ll plant accordingly” (RD&E No. 6).

Grain producer and adviser advocates of each risk management strategy recognised the alternate strategies and commented as to why the alternate strategies were not appropriate for them.

We have above characterised the grain production system and identified the emergence of three distinct planting strategies within it that hinge upon varying readings of four factors: stored soil water; maintenance of the cropping system; long term profit; and short term economic pressure. We know turn to characterising the RD&E system, focusing on perceptions of the shift from a publicly funded extension system to one dominated by commercial agronomic advice. We again draw on the full interview sample to ask: What is the relationship between the forms of advice now available and the three planting strategies? In this case it is the organisational settings and commercial terms of that advice that form key variables. Trends
towards the differentiation of advice according to its price, the privatisation of learning by producers, and fragmentation of advice were ascertained.

THE RD&E SYSTEM AND PLANTING STRATEGIES

As an interviewee stated, in the past: “75% of people who used some professional advice would have used the Department of Primary Industry’s [district] agronomist” (Grain Producer No. 20). Asked for their perceptions of how the extension system has changed, all of the RD&E interviewees expressed a view that Queensland Department of Primary Industries (QDPI) extension services had declined leaving a hole in agronomic advisory services for grain producers. Turning to the 24 grain producer interviewees, 15 stated that the extension service offered by QDPI had declined. Statements included:

“DPI have withdrawn the service. They don’t provide one-on-one agronomic advice at all as department policy” (Grain producer No. 20);

“We haven’t got a public system anymore so you’ve got to use private ones” (Grain producer No. 7);

“There is no service. There’s only the service you’re willing to pay for” (Grain Producer No. 22).  

The QDPI extension service at issue included provision of on-farm advice to individual grain producers, running district trials, field days, shed meetings and bank updates by district based extension officers. We were informed that this district based service had in the past yielded an impressive catchment of contact with Darling Down grain producers: “Over the decade or so we had contact with at least

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8 Considerable bitterness was also expressed by two grain producers that wheat varieties developed through QDPI and paid for with producer levies have been bought by seed companies and sold back to producers.
90 per cent of all the growers [in one district]” (RD&E No. 15). The interview data suggested that the loss of district extension officers possessing over 10 years experience and thus high levels of local respect has changed the terms of engagement between the grain production system and RD&E systems on three fronts. Firstly, facilitation of peer learning on a district wide (spatial) basis has diminished. Secondly, privatised learning clusters of leading farmers have developed around commercial agronomists. Finally, information sources have multiplied along with the number of organisation in the RD&E system confronting grain producers with more information but information that is conflicting and fragmented. We discuss these three developments in turn.

Firstly, facilitation of peer based learning was perceived as a key function of the QDPI district extension officers. The interview data confirms the rural sociological finding that beyond experiential learning, peer referencing remains the main point of reference for consideration of new practises and strategies by grain producers (Burton, 2004; Kilpatrick, 2002). Thirteen producer interviewees discussed how ‘looking over the fence’ forms an important backdrop to their grain production decisions:

“Probably the biggest one … is other farmers … in this district [and] in other districts. What are you doing; how much are you doing; what do you think about doing this? That sort of inter-farmer play …” (Grain Producer No. 22).

Pivotal decisions such as when and to what extent to plant are checked against neighbour’s decisions, even an admission by a producer that he will “jump the fence with a probe and have a look [at the depth of soil water]” (Grain Producer, No. 1).
Diffusion of new practices such as zero tillage and deep (moisture seeking) planting occurs through social surveillance (Coughenour, 2003), a process described by grain producers as a change in the social status of innovators:

“there must be some method in their madness … even though for years we thought they were mad, completely and utterly crazy” (Grain Producer No. 2);

“it was a complete turnaround from being a mad bastard to ‘good on you’” (Grain Producer, No. 13).

Today, opportunities for social surveillance of other grain producers beyond one’s immediate neighbours, for example at field days and shed meetings, are perceived as: “a lot more limited than they used to be … [Q]DPI used to really aid it (Grain Producer No. 22). Indeed, the commercialisation of agronomic advice under the policy philosophy that the user should pay for services that generate private gain has encouraged cynicism and apathy about extension events generally:

“You get a bit sour in yourself” (Grain Producer No. 15);

“It’s changed the fundamental attitude of cooperative farming [with] bipartisan support” (Grain Producer No. 22).

Four of the RD&E interviewees pointed to a loss of credibility of extension events with producers, stating that field days had deteriorated into box ticking exercises that offered little new and relevant information. The fragmentation of extension effort as more organisations compete for the attention of grain producers has lowered the relevance of extension gatherings to the grain production system as a whole. Facilitation of peer learning on a district wide basis by a single agency has declined.
Secondly, the RD&E system was perceived as less internally coherent because without a strong publicly funded extension service focused on production, the difference in the commercial terms of engagement between private and retail agronomists becomes more significant. That private consultants are paid an annual retainer enables them to integrate a wide range of R&D inputs and distil those inputs into a service tailored to individual enterprises. Private consultants are paid enough per client to invest significant amounts of time facilitating the learning of each client:

“We just religiously record all our clients’ rainfall data and we test it paddock by paddock, based on starting date or fallow length. So at any point in time, we can rattle off just about any starting soil water with every paddock for every client. We’ve got model runs and experience with other customers that they will never have seen and we go through it with them ... and gradually, we’re breaking through ... but it takes time ... some ... have to learn by mistakes first ... even though you go out of your way to try and prevent it from happening” (RD&E No. 3).

Private agronomists winnow clients viewed as difficult or unresponsive to advice. In describing their client base, one private agronomist stated:

I would suggest they’re the top 10% ... all of them came to me, not me to them ... I don’t take all comers ... My time demands are fairly tight, but there’s always room to take on a better client and then move somebody else out ... people who are going to benefit from your work, the others only frustrate you (RD&E, No. 9).
The private agronomists interviewed stated that their sector could not fill the extension hole left by the excise of public one-on-one extension regarding production:

“There are not a lot of people in a lot of the area that use consultants” (RD&E No. 10);

“The department … thought the commercial world would step in and take over. That’s never been the case” (RD&E No. 4);

“It goes nowhere near it because we haven’t got the people … the other problem is that … when you … say you want to charge for it, well, it’s [a] bloody hard sell” (RD&E No. 6).

Peer learning, the main point of reference for producers generally, appears to have consequently become more fragmented and privatised. Six of the 24 grain producer interviewees were involved in farmer groups run by private agronomists. One producer was relying upon a farmer group run by a retail agronomist. Four grain producer interviewees mentioned a Top Crop Farmers Group that employed their own agronomist.\(^9\) In these privatised learning clusters, peer learning between grain producers was formally facilitated with enterprise benchmarking programs, crop tours, pre- and post-harvest meetings, monthly meetings, guest speakers etc. Advisors who facilitated peer based learning were highly valued by their clients:

“You need to be in a group that’s got good farmers in it” (Grain Producer, No. 14);

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\(^9\) Two grain producer interviewees mentioned a Western Australian Farmers Group, 1 mentioned a LandCare group and 1 mentioned a district based Farmers Group as important sources of information and peer learning.
“He gets all the clients together and they talk over issues” (Grain Producer, No. 17).

Three of the grain growers who employed private agronomists suggested that only larger operators were sufficiently free of immediate economic pressure to build a business case for investing in good advice:

“If you deal with the top 10 or 15% of the agronomic community then you’ve got growers who can afford to do or not do things a bit differently” (Grain Producer No. 20);

“As we got bigger we needed farm managers to have access to agronomists” (Grain Producer No. 19).

Interviewees who ran smaller enterprises commented that investment in an annual retainer to employ a private agronomist was too large financial commitment:

“It’s so hard to think about employing an agronomist … when you’re right down the bottom. You’ve just come through a drought and your cash flow’s zilch. You just can’t do it. You just don’t want to make a commitment that you can’t maintain. That’s the problem and it really is a problem” (Grain Producer No. 18).

The advice afforded by retail agronomists was not as clearly associated by the interviewees with the facilitation of learning. Retail agronomists were described by 18 interviewees as inexperienced “glorified salesmen” whose advice tended to be conservative and risk averse. Retail agronomists interviewed stated that they expressed opinions but did not ‘push too hard’. While many retail agronomists believed it was best not to plant crops with limited stored soil water, they were not
prepared to argue the point with grain producers because lost sales and upset clients were at stake:

“If you say don’t plant because you haven’t got three foot of moisture it’ll bite you on the bum, quick and lively” (RD&E No. 17).

Private agronomists commented that the more reserved advice of retail agronomists was consequently open to multiple interpretations:

“they’re very stand back, and then of course you get a hundred different responses to the same piece of advice” (RD&E No. 3).

The ability to improve the quality of advice provided by retail agronomists was described by four interviewees as undermined by a shortage of agronomic staff and lack of company commitment to ensuring mentoring and knowledge sharing occurred in a team led by a senior agronomist. This lack of a strong professional network to support the learning of retail agronomists formed a striking contrast to the powerful networks described by consultant agronomists, many of whom were ex-QDPI employees with strong links to Queensland, inter-state, national and international researchers and technology developers.10

Private and agency RD&E agronomists viewed the ability of grain producers to improve their planting decisions with better understanding of the role stored soil water plays in crop performance as dependent on their ability to afford good quality advice:

“Where they’ve got advisers, consultants, on a fee for service basis, generally they would be reasonably well led … [otherwise] quite often it

10 However, agronomists working in nationally focused companies within the retail sector also possessed powerful research and development networks.
would be at best based on a push probe, at worst, having a scratch, like a chook” (RD&E No.1).

Peer learning without the added value of good agronomic advice was viewed as an unreliable learning methodology:

“… other farmers … [are] a useful way of getting some practical knowledge [but] … some of the information may not be quite right because it’s been handled two or three times” (RD&E No.4).

The third front on which engagement between the grain production and RD&E systems has altered concerns the pattern of agronomic information provision. Without access to a private agronomist to integrate and distil information, grain producers are confronted with more information but information that is fragmented by the larger number of RD&E organisations:

“The biggest trouble that farmers have got to deal with is conflicting advice” (RD&E No. 6).

“We’re bombarding people with too much information. Messages get distorted … realistically some of the newsletters probably should be combined and sent as one, rather than saying, well I need to do it … because it’s my company logo over the top of it” (RD&E No.4).11

In summary, privatised learning clusters of leading farmers have developed where producers perceive retaining a private agronomist as an investment in enterprise profitability because it provides access to facilitated learning and distilled information. Those grain producers relying upon retail agronomists, in contrast, negotiate ‘stand back’ advice and fragmented information in order to incorporate

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11 However, the Grains Research and Development Corporation updates, mentioned unprompted by 11 interviewees remains a common point of reference for information.
information into their decision-making, including the incorporation of stored soil water information into their planting decisions.

DISCUSSION

We stated in our introduction that the poor performance of the winter 2007 winter crops on the Darling Downs of Southern Queensland raised two controversial questions. A social systems approach was taken to unpacking these questions. The first question was how grain growers took account of their stored soil water levels when deciding whether or not to plant their crops. This study has found that Southern Queensland producers take account of stored soil water in their planting decisions in three differentiated manners. Varying weightings of long term enterprise profitability, pressing economic pressures, and the need to maintain the cropping system, have led grain producers to different strategies for managing planting risk.

The second question was what role public and commercial agronomists played in such decision making. The answer here is both retail and private agronomists discuss stored soil water levels with their clients, but private agronomists take their annual retainer as permission to argue the point and invest time in supporting the learning of their clients. Leaving the E in RD&E to the private sector appears to have accentuated the difference between types of commercial advice. In short, neo-liberal policy settings have encouraged a process of internal differentiation within both the RD&E system and the grain production system. This internal differentiation also has the effect of changing the terms of engagement between the two systems, the points at which they connect or hinge.

The RD&E system is now bisected between publicly funded extension with an agri-environmental focus and private commercial advice regarding production. Without publicly funded research and extension focused on production, the
difference between the ‘thick’ E provided by private agronomists (patiently arguing the point, distilling and tailoring information, facilitating peer learning) and ‘thin’ E provided by many retail agronomists increases in significance. As Stone (2005) reports, advisory agribusinesses classify clients into A, B and C clients with private agronomists targeting A clients, retail agronomists targeting B clients and both discouraging engagement with C clients. This differentiation of likely clients is of particular relevance to the diffusion of knowledge intensive technologies. Unlike knowledge embedded technologies such as new seed varieties, knowledge intensive technologies cannot be slotted into the existing farming system via a transfer of technology extension approach but necessitates an investment in learning to convert into practise change. Secondly, the reliance of the RD&E system upon agribusinesses for extension may not be sustainable in terms of human resources. The current skill capacity in the RD&E system is embedded in senior agronomists. In the interview sample utilised for this study many senior agronomists had left public agencies to establish themselves as private agronomists. Junior agronomists were described by our interviewees as predominately employed in the retail agribusiness sector and lacking access to mentors and team environments.

CONCLUSION

A suggestion regarding the RD&E and grain production systems is pointed to by the above analysis. Development of common platforms for discussion of key farming system production issues could counter the process of differentiation that have pluralised and fragmented the terms of engagement between the RD&E system and grain production system. Economic quantification of the role of soil water in planting decisions is such a key production issue. The comparisons and the assessments made between the three risk management strategies advocated by grain producer
and adviser were made almost exclusively in qualitative terms. Interviewees discussed stored soil water levels in terms of being: “½ or ¾ full”; “wet to 30 cm” or “one foot of wet soil”; or even having “120 mm of plant available water”, but detailed analyses of crop yields and economic returns were rarely discussed. Quantitative and probabilistic comparisons of the crop yields and economic performance of planting with different levels of stored soil moisture were only referred to by three agronomists and two grain producers. These agronomists undertook economic analysis to inform their advice to producers but avoided using this detailed data when discussing recommendations with their clients. These strategies and decisions did not appear to be under any public, industry wide scrutiny. Rather agricultural advice appeared to be operating on a laissez-faire basis, with no clear grain industry leadership encompassing both the grain production and RD&E systems to compare approaches and challenge both individual grain producers and advisers regarding these increasingly differentiated planting strategies. A common platform for public analyses of yield outcomes and economic performance (for eg. gross return, net returns and cash flow implications), both for annual planting decisions and over multiple years (long term), could address this deficit.

ACKNOWLEDGEMENTS

Our gratitude is extended to the interviewees who kindly spared time to give us their views on this topic. Thanks are due also to the agencies who commissioned this research, CSIRO Sustainable Ecosystems, Queensland Primary Industries and Fisheries, and the Grains Research and Development Corporation. We are also the beneficiaries of critical comments provided by Zvi Hochman and Michael Robinson.
REFERENCES


Table 1. Interview sample stratification

<table>
<thead>
<tr>
<th>Southern Queensland RD&amp;E System</th>
<th>Interviewees</th>
<th>Southern Queensland Grain Production System</th>
<th>Interviewees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retail Agronomists</td>
<td>5</td>
<td>Eastern Floodplains Darling Downs</td>
<td>4 producers</td>
</tr>
<tr>
<td>Consultant Agronomists</td>
<td>6</td>
<td>Eastern Uplands Darling Downs</td>
<td>7 producers and 1 father/business partner</td>
</tr>
<tr>
<td>Agencies (CSIRO, QDPI, QDNR&amp;W, NRM Regional Bodies)</td>
<td>9</td>
<td>Near West Darling Downs</td>
<td>6 producers and 4 marital/business partners</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Far West Darling Downs</td>
<td>6 producers and 2 marital/business partners</td>
</tr>
<tr>
<td><strong>Sub-total</strong></td>
<td><strong>20 interviews</strong></td>
<td><strong>Sub-total</strong></td>
<td><strong>23 interviews</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>43 interviews with 50 interviewees</strong></td>
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<td></td>
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Table 2. Breakdown of planting strategy advocates

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Producers</th>
<th>Advisors</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Agency</td>
<td>Private</td>
<td>Retail</td>
</tr>
<tr>
<td>Do not plant unless SSW* threshold is reached</td>
<td>9</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Take opportunity to plant at least some crop each season</td>
<td>14</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Plant at appropriate time to max. crop yield, SSW a bonus</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>25</td>
<td>10</td>
<td>5</td>
</tr>
</tbody>
</table>

* SSW = stored soil water