

PRIORITY ISSUES PAPER

for the NORTHERN REGION GRAINS INDUSTRY

2010

Prepared by: Northern Region Grains Research Advisory Committees

April 2010



Shaping Grain

through Science

GRAINS

RESEARCH ADVISORY COMMITTEES

(Northern Region)

PRIORITY ISSUES PAPER

2010



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INTRODUCTION

The eight (8) Northern Region grains Research Advisory Committees (RACs) each held meetings in July / August 2009 and February / March 2010. During the meetings, emphasis was placed on reviewing issues based on current and emerging production constraints, taking into account the opportunities and threats facing the Northern Grain industry. The issues were then prioritised on the basis of economic impact on the profitability and sustainability of the regional grain industry.

The eight Northern Region RACs are:

Region	Districts
<u>Queensland</u>	
Central Qld (CQ)	Clermont, Emerald, Springsure, Moura, Theodore, Monto, Biloela, Rockhampton & Mackay districts
South East Qld (SEQ)	Mundubbera, Gayndah, Kingaroy, Gympie & Bundaberg, Gatton & Boonah districts
Darling Downs (DD)	Toowoomba, Warwick, Pittsworth, Millmerran, Dalby and Chinchilla districts
Western Downs & Maranoa (WDM)	Taroom, Roma, Miles, Tara, Goondiwindi & St.George districts
<u>New South Wales</u>	
North West NSW (NW)	West of Newell Highway (incl. Narrabri and Moree) & north of Castlereagh Highway (incl. Coonamble & Walgett)
North East NSW (NE)	East of Newell Highway from Liverpool Range to Qld border including the north coast NSW region
Western Plains NSW (WP)	West of Newell Highway (incl. Gilgandra to Dubbo) & south & west of Castlereagh Highway (incl. Collie, Warren & Nyngan)
Central East NSW (CE)	East and south of Newell Highway (inc. Coonabarabran, Coolah, Merriwa) to Macquarie Valley (incl. Gulgong & Wellington)

Each RAC has developed its own Priority Issues document. The Priority Issues documents all have the same structure:

1. Region profile
2. RAC membership
3. Crop importance profile
4. Priority issues.

Regarding the "Crop Importance Profile", each RAC determined the regional importance of the individual crops presently available for production as well as the possible future importance (2015-18). This was done to ensure that the Priority Issues reflect the thoughts about both the present and future regional cropping programs. The goal is to ensure that investments in individual crop research programs are commensurate with the importance of the individual crops. The Crop Importance categories are as follows:

- Dominant
- Important
- Other.

The format of the Priority Issues section of the document is outlined in the following table:

Column Heading	Description
Line of Business	The Priority Issues determined by the eight (8) RACs are presented using the Grains Research and Development Corporation's Lines of Business: <ol style="list-style-type: none">1. Varieties2. Practices3. New Products4. Communication and Capacity Building
No.	This is simply a numbering system for easy reference. It does not imply a level of importance.
HP (Highest Priority)	Each RAC was challenged to nominate approximately ten Highest Priority (HP) Issues within its list of Priority Issues. The purpose of this categorization is to flag for Research, Development and Extension (RDE) Agencies the 'must do' issues for RDE investment. This does not lessen the importance of the remaining Priority Issues.
Priority Issues	Each RAC was challenged to nominate approximately twenty (no more than thirty) Priority Issues for RDE investment. Each RAC would expect RDE investment to address these Issues if funds were available.
Comments	Where available, comments have been provided to support each Priority Issue.

Please note: For further information about grains research priorities in the Northern Region contact the Chairman of an RAC or the Northern Region RAC co-ordinators:

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Central Queensland RAC

PRIORITY ISSUES 2010

1. Profile

The Central Queensland (CQ) region represents the northern limits of major broad-acre grain production in Eastern Australia. As a result, it poses additional challenges to agricultural research and development. These challenges include the quest for regionally adapted plant varieties and support for appropriate technology for crop production in a predominantly summer rainfall environment. Rainfall is unreliable for cropping and it strongly influences farmer responses to practices adopted and the mix of crops actually grown under rain-fed situations (mainly wheat, sorghum). For the sustainability of cropping in the region, it has been necessary to develop farming systems appropriate to the soils, topography and seasonality. It has also become necessary to distinguish country suited to continuous cropping.

2. CQ RAC Membership

Name	Location	Occupation	Position
BALLENTINE Myles	Banana	Grain Grower	Member
DUNNE Colin	Duaringa	Grain Grower	Member
DURKIN Peter	Theodore	Grain Grower	Member
EDEN Shane	Springsure	Grain Grower	Member
FARQUHARSON Andrew	Clermont	Grain Grower & Consultant	Member
GREGG Nigel	Middlemount	Grain Grower	Member
MACTAGGART Michael	Moura	Grain Grower	Member
STOREY David	Capella	Grain Grower	Member
DOUGLAS Col	Warwick	Scientist	Member
JORDAN David	Warwick	Scientist	Member
MCINTOSH Paul	Emerald	Agronomist	Member
SEQUEIRA Richard	Emerald	Scientist	Member
SPACKMAN Graham (Chair)	Emerald	Consultant	Member
SHEPPARD John	Toowoomba	GRDC	Nominee
WARD Andrew	Toowoomba	DEEDI	Nominee
CHAPMAN Scott	Brisbane	CSIRO	Nominee
MIDMORE David	Rockhampton	CQU	Nominee
LUND David	Clermont	GRFL	Nominee

3. Crop Importance Profile

Importance Category	Crop	Forecast Change by 2015-18	Comments
Dominant	Sorghum	Stable	<i>Sorghum is by far the most dominant crop in CQ.</i>
	Wheat	Reasonably stable with reduction in milling and increase in feed supply	<i>Wheat is the dominant winter crop with milling quality remaining the main focus. However there is some move to producing for the domestic feed markets. There is a limited interest in durum.</i>
	Chickpea	Stable	<i>Chickpea is proving to be a key crop for its rotational value. Lack of post harvest stubble is a limitation.</i>
Important	Maize	Possible slight increase	<i>Growers are showing an interest in dryland maize to widen the summer crop planting window.</i>
	Mung bean	Stable	<i>Opportunity summer crop requiring expert management.</i>
Other	Barley	Possible slight increase	<i>Some interest in producing barley for the domestic feed markets.</i>
	Sunflower	Stable	<i>Only small interest in sunflower due to Tobacco Streak Virus, high freight costs and low post harvest stubble.</i>

GRDC Lines of Business	Subject	No	Rating	Central Queensland Priority Issues for 2010	Comments
Varieties	Sorghum	1	HP	<p>Breed for:</p> <ul style="list-style-type: none"> ▪ adaptation to CQ hot, dry conditions <ul style="list-style-type: none"> ▪ suitability for wide row & skip row planting ▪ suitability for CQ crop sequences ▪ increased root vigour ▪ tillering range responding to population density ▪ standability under moisture stress ▪ large & uniform grain size ▪ improved grain digestibility and palatability for livestock and quality suitable for ethanol ▪ ergot, Charcoal & Fusarium Stalk Rot resistance ▪ non-GMO herbicide resistance 	<p>Sorghum is the dominant CQ crop and is forecast to remain so. Varieties better suited to wide rows or controlled water systems to avoid moisture stress are required. Need to increase both yield stability and standability through stay green. Ergot resistance will significantly widen the planting window for sorghum.</p> <p>As the feed market becomes more demanding with regard to grain quality, producers need to target these quality attributes. This is particularly so if objective quality testing is introduced for payment. Also growers are keen to develop additional markets for sorghum: e.g. ethanol.</p> <p>Non-GMO herbicide resistance in sorghum would be helpful in overcoming grass weed problems in CQ (e.g. Feathertop Rhodes and summer grass).</p>
	Wheat	2	HP	<p>Wheat varieties that are susceptible or very susceptible to cereal rusts should not be released, and those that have been released should be withdrawn from the market. All wheat varieties in CQ should be resistant to all pathotypes of stem rust, and at least Moderately Resistant to all pathotypes of leaf rust.</p> <p>Breed for</p> <ul style="list-style-type: none"> ▪ higher & more stable yields under limiting moisture conditions ▪ longer coleoptile length ▪ black point and pre-harvest sprouting resistance for the milling market ▪ yellow spot and crown rot resistance (to take advantage of continuous cropping potential) ▪ produce high yielding wheat for the feed & industrial markets <p>Specific wheat breeding effort is required for CQ – including targeted breeding objectives. Early generation selection and evaluation needs to be done in the region.</p> <p>Develop longer season PH varieties suitable for CQ.</p> <p>Use clearfield-type breeding technology to assist with weed control.</p>	<p>Having susceptible varieties in the production system significantly and unacceptably increases the risk that existing resistances will be overcome. This jeopardizes the productivity of the industry, and the investment that industry has made in developing resistant varieties.</p> <p>Select for rooting capability to increase moisture utilisation from soil depth. Longer coleoptile required for deeper planting.</p> <p>The milling market remains the key market for CQ wheat.</p> <p>There is also an increasing demand from the domestic feed market. However, to be economically viable in the region, feed varieties need to have 20 to 30% yield advantage over milling quality varieties.</p> <p>Longer season PH varieties are required for early, deep planting in March/April.</p> <p>This technology will help improve management of grass weeds.</p>

GRDC Lines of Business	Subject	No	Rating	Central Queensland Priority Issues for 2010	Comments
Varieties (cont'd)	Grain legumes	3	HP	<p>Breed for</p> <ul style="list-style-type: none"> ▪ increased mung bean and chickpea yields ▪ adequate disease & weathering resistances, especially <i>Ascochyta</i> blight resistance or tolerance in CQ varieties; and TSV and powdery mildew resistance in mung beans ▪ grain quality attributes for the food market. ▪ chickpea variety to suit earlier planting opportunities. <p>Alternative pulses that suit the CQ production system are required.</p>	<p>CQ requires ongoing grain legume breeding to increase the level of adoption of legumes in CQ cropping systems. This includes selecting varieties with increased stubble, height and tolerance to diseases.</p> <p>A longer season chickpea variety would be useful - for planting up to two weeks earlier than current varieties.</p> <p>While chickpea is a well-suited winter pulse in CQ, mungbean is the only summer pulse suited to the region, and its unreliable performance prohibits larger areas being grown. A more reliable summer pulse crop option is needed to increase adoption of pulse crops.</p>
	Maize	4		<p>Breed maize varieties suitable for CQ dryland and irrigated environments:</p> <ul style="list-style-type: none"> ▪ yield ▪ row configurations – suitability for wide rows ▪ stress tolerance ▪ range of grain types needed to satisfy various market opportunities. ▪ 	<p>Improved adaptation to the CQ production environment is required. Improved maize reliability would provide another potentially profitable crop in the CQ farming system.</p>
	GM	5		<p>Use GM technology in breeding to improve crop performance</p>	<p>Where there is industry agreement, use this technology to maintain industry's international competitiveness.</p> <p>GM technology could deliver value for both input (insect and herbicide) and output traits (e.g. novel products).</p>
	NVT	6		<p>Ensure the successful implementation of NVT. This includes yield testing and the assignment of disease ratings relevant to CQ production systems and environments.</p> <p>Wheat and barley varieties that are susceptible or very susceptible to cereal rusts should not be included in NVT trials. All NVT entries should be Resistant to all pathotypes of stem rust, and at least Moderately Resistant to all pathotypes of leaf rust.</p>	<p>Queensland Wheat Variety Guide is valued in its current form.</p>

GRDC Lines of Business	Subject	No	Rating	Central Queensland Priority Issues for 2010	Comments
Practices	Systems	7		<p>What is the benefit of a ley pasture phase in the CQ cropping system: (i) during the pasture phase; and (ii) to subsequent cropping phases (profitability, carbon levels, nutrients, etc.)?</p> <p>What is the impact (agronomic, economic, system and environmental) of stubble grazing on subsequent crop performance?</p> <p>What are the benefits (economic, soil fertility, etc.) of pulses in the CQ cropping program?</p> <p>Continue to develop ideal crop rotations and crop selections, including management practices in order to help alleviate problems being experienced with grass weeds and other issues such as soil fertility and sustainable production.</p>	<p>Many CQ farms run both grain and grazing enterprises. In many cases, both enterprises are conducted on the same land at different times. Successful integration of cropping and beef production enterprises requires an understanding of the economic and environmental benefit, and management of the grazing phase, and its impact on subsequent cropping phases. This applies to ley pasture phases and grazing of crop stubble.</p> <p>Pulses are potentially profitable in the CQ cropping system, but their agronomic, economic and soil fertility benefit has not been clearly defined.</p>
		8		Develop a better understanding of irrigated grains agronomy.	There has been little CQ-focussed research in recent decades on best-practice agronomy in irrigated grains and pulses.
	Soil Fertility/ Crop Nutrition	9		Determine appropriate management and crop selection for sub-soil constraints & extend the current knowledge.	Previous research identified areas with constraints but now good solutions are being identified, so it needs continued support. An extension effort is required
		10	HP	<p>Develop a better understanding of the interaction between current farming systems and the soil environment: specifically matching soil fertility and soil biology to water availability and improved WUE.</p> <p>Develop strategies to maintain soil fertility, and soil tests and other tools that accurately identify situations where fertiliser application (especially P fertilisers) will be economically viable.</p>	Maintaining or improving soil fertility is vital for profitable and sustainable grain crop production. It is important that grain producers and their advisors have tools (including soil tests) that allow them to select fertilisers and fertiliser rates (particularly for P) that increase profitability, especially when fertilizer prices are high.
	Climate – adaptation strategies	11		Adaptation strategies are required to deal with climate variability and climate change.	Weather and climate have the most influence on profitability, and are likely to do so increasingly in the future. Therefore adaptation strategies are required.
				Production strategies need to be developed that will effectively and profitably deal with climate variability/change and the new carbon economy.	

GRDC Lines of Business	Subject	No	Rating	Central Queensland Priority Issues for 2010	Comments
Practices (cont'd)	Diseases	12		Develop management strategies for Tobacco Streak Virus (TSV).	TSV poses a major threat to profitable sunflower production and is also a concern in mung beans and chickpeas.
	Weeds	13	HP	Develop best management practices for hard to manage weeds with priority on Feathertop Rhodes Grass, fleabane and sweet summer grass.	Feathertop Rhodes is developing into a major weed problem throughout the region, with growers commonly reverting to cultivation for control. Similarly, sweet summer grass has become a major weed, especially in northern parts of the region 'Systems' management of these weeds is needed.
		14	HP	Develop and extend best management practices to minimise the risk of herbicide resistance developing.	The threat of resistance to weeds in zero tillage systems is a major concern. Improved integrated weed management systems are required to avoid or manage resistance. IWM workshops are needed in the region.
	Safe Spray Practices	15	HP	Provide extension promoting safe spraying practices: e.g. more demonstrations and increased awareness of known technology (field trials). Improved compliance could be achieved through accreditation or Grains BMP.	Spray drift remains an important issue in CQ, and affects both grain farmers and graziers. The impact of adjuvants and application technology on drift management needs to be better understood by chemical users.
	Precision Agriculture	16		Continue the development of applications for PA technologies to help manage spatial variability in crop performance and to improve the efficiency of inputs.	Use of PA tools and technology to improve efficiency of use of farm inputs, and to develop more accurate farm records. This should include evaluation of variable rate technology.
	Agronomy packages	17		Develop 'best management' agronomy packages in the CQ production environment for: <ul style="list-style-type: none"> ▪ sorghum, ▪ wheat, ▪ pulses ▪ maize. 	The CQ production environment is challenging and performance of individual crops and varieties is often variable and lower than expected. Agronomy packages would help ensure maximum performance is achieved for the crops and varieties available in CQ.
New Products	Ethanol	18		Develop new markets for grain: e.g. ethanol production.	Growers are keen to develop alternative markets to traditional and current feed and food markets.
Communication & capacity building	Grower Groups	19	HP	Make greater use of Grower Groups for experimentation and extension.	Growers learn best from other growers who successfully adopt and adapt technology.
	Agriculture as a Career	20		Promote agriculture as a career	Aim to address the existing and future skills shortage in all facets of agriculture (on-farm, agribusiness, and in RD&E). Undergraduate scholarships could help increase enrolments at Universities.

Western Downs & Maranoa RAC

PRIORITY ISSUES 2010

1. Profile

Wheat production is the single most significant farming activity in the region with other crops normally only considered when the risks of growing wheat are seen as excessive. While there is a general awareness amongst grain growers that there may be an undue dependence on wheat, other crop options have tended to be regarded as needing to stand alone in terms of comparative profitability to wheat. The lack of profitability of alternative crops has meant that acceptance has been generally slow and limited in area. However, rotations are known to impact farm profitability by assisting with the management of diseases and pests.

2. WDM RAC Membership

Name	Location	Occupation	Position
BENSON Nick	Billa Billa	Grain Grower	Member
BOLAND Nev (Chair)	Goondiwindi	Grain Grower	Member
CROCKER Jennifer	Muckadilla	Grain Grower	Member
DUFFIELD Mark	Goondiwindi	Grain Grower	Member
HILL Elizabeth	Nindigully	Grain Grower	Member
KLUCK Andrew	Goondiwindi	Grain Grower	Member
NASON Charles	Wallumbilla	Grain Grower	Member
FRENCH Vic	Condamine	Grain Grower & Consultant	Member
BACH Ann-Maree	Miles	Grain Grower & Agronomist	Member
BORRELL Andrew	Warwick	Scientist	Member
COLBORNE James	Roma	Agronomist	Member
DIETERS Mark	Brisbane	Scientist	Member
KAPCEFEVS Thomas	Narrabri	Scientist	Member
STURGESS John	Warwick	Scientist	Member
TAYLOR Rob	Macalister	GRDC	Nominee
POULSEN David	Warwick	DEEDI	Nominee
MCINTYRE Lynne	Brisbane	CSIRO	Nominee
SCANLAN Damien	Goondiwindi	GRFL	Nominee

3. Crop Importance Profile

Importance Category	Crop	Forecast Change by 2015-18	Comments
Dominant	Wheat	Milling - Decrease Feed - Increase	<i>Milling wheat production is the major focus with some increasing focus on feed markets.</i>
Important	Sorghum	Stable	<i>Sorghum is the most important summer crop with focus on supplying the local feed markets.</i>
	Chickpea	Stable	<i>Chickpea is the main grain legume crop although production remains below the desired target.</i>
	Barley	Feed - Stable	<i>With the focus on feed wheat production feed barley remains a lesser interest.</i>
Other	Mung Beans	Stable	<i>Considered an opportunity crop requiring specialist management.</i>
	Millets	Stable	<i>Opportunity crop with good prospects as a short-term cover crop.</i>

GRDC Lines of Business	Subject	No	Rating	Western Downs & Maranoa Priority Issues 2010	Comments
Varieties	Wheat	1	HP	<p>Breed for:</p> <ul style="list-style-type: none"> ▪ higher yields through increased efficiency of water uptake and partitioning to grain <ul style="list-style-type: none"> - wider planting window - suitability to wide row & deep planting - larger, uniform grain size - lines with reduced tillering ▪ resistances to foliar, root/crown diseases and nematodes ▪ qualities for the milling, feed & industrial markets ▪ resistance to pre-harvest sprouting & black point <p>Maintain the focus on bio-security for Ug99 rust and Russian Wheat Aphid.</p> <p>Specific wheat breeding effort is required for WDM – including targeted breeding objectives. Early generation selection and evaluation needs to be done in the region.</p>	<p>Wheat is the dominant crop in this region. Need to breed wheat varieties which will yield under limited moisture and produce quality grain for the milling & feed markets. Wheat is already being supplied to the domestic feed lot markets and this demand is forecast to continue to increase. Foliar diseases including rusts, crown rot, and yellow leaf spot are major concerns in controlled traffic systems. Higher yields are achieved by planting early (i.e. April) so longer coleoptile varieties are required for planting at depth (up to 12 cm).</p> <p>Varieties more suited to wider rows are required.</p> <p>Root architecture that suits the production environment (adaptation to climate variability; sub-soil constraints) is required.</p> <p>It is estimated that Stripe Rust is costing growers \$100M annually. Genetic rust resistance in varieties is preferred to spraying.</p> <p>Research has shown that a significant number of trials need to be grown in this region to find adapted varieties. Selection trials and NVT trials need to address the genotype-by-environment interaction in this region.</p>
		2		Develop objective measures for coleoptile length & seedling vigour	A vigour rating is needed for wheat seed based on coleoptile length & strength, particularly for early season deep planting.
	Sorghum	3	HP	<p>Breed for:</p> <ul style="list-style-type: none"> ▪ higher yields through increased efficiency of water uptake and partitioning to grain through <ul style="list-style-type: none"> - a wider planting window - lines with low tillering - large and uniform seed ▪ qualities for the feed and industrial markets ▪ improved standability <p>Evaluation and selection of breeding lines must occur in the WDM region. Varieties are required that are specifically adapted to the WDM region. Management packages are also required for new varieties, including information about how they best to fit it into the WDM production system.</p>	<p>Sorghum is the second most important crop in the region and an important rotation with wheat for soil borne disease and weed control.</p> <p>Varieties are needed which can withstand both pre- and post-anthesis stress (especially from heat waves).</p> <p>Lodging remains a major problem.</p> <p>A low tillering trait will provide growers with an option to better manage marginal moisture and grain size.</p> <p>Growers want the option to plant in September without the risk of poor emergence.</p> <p>Domestic ethanol is seen as an important future market.</p> <p>Producers in the WDM region are testing pasture and sorghum integrated systems.</p>

GRDC Lines of Business	Subject	No	Rating	Western Downs & Maranoa Priority Issues 2010	Comments
Varieties (cont'd)	Barley	4		Breed for: <ul style="list-style-type: none"> ▪ higher yielding feed quality ▪ improved disease resistances ▪ larger more uniform seed size. ▪ Resistance to Northern Region diseases is essential.	While barley is not a dominant crop in the region it remains important. With the increasing demand for feed grains, barley provides another winter crop feed grain option. Varieties with improved yield & disease resistance are required. Also varieties are required that don't produce screenings above the feed market limits.
	Grain legumes	5		Breed grain legumes for inclusion in cereal cropping rotations to assist with nutrition & soil borne disease control. The current production focus is on chickpea and to a lesser extent, mung beans.	Introduction of grain legumes as break crops is necessary to best manage soil borne cereal diseases, weeds, nematodes & arrest fertility decline. It is essential that adequate stubble is produced. Fertility decline and increasing N prices are major concerns for wheat growers. Chickpea is regarded as an important crop and mung beans as an opportunity crop.
	Climate adaptation	6	HP	Crops that can be used for multiple purposes are required to help growers adapt to increasing climate variability and climate change.	For example, barley is a crop that can be used for grain, forage or biofuel. This sort of versatility in crops is required by growers as they continue to adapt to climate variability, since it gives them more options in a given season, as well as in their crop rotations.
	NVT	7		Provide credible and unbiased testing of varieties and "hard copy" reports of the data.	Growers need factual (not necessarily independent) information on varietal performance. This is becoming increasingly important as pedigree breeding is being transferred to the private sector. There is concern that National Variety Trials need improving and diseases need to be rated in the production environments
	Quality	8		Understand feed quality attributes of different grains. Quantify in dollar terms, the market value of feed quality.	Grain growers want to be paid according to objective feed quality tests, but additional research needs to be done before this will happen. Presently the feed market pays for quality according to test weight, seed size & moisture.
Practices	Systems	9		Enhance practices to enable the transition from cropping to pasture and vice versa. RD&E into new pasture species (e.g. sulla, burgundy bean and others) will ensure more flexibility and diversity is available to growers making the cropping/pasture transition.	More growers are including grazing as part of their cropping system. Research is needed to identify a pasture phase option as an alternative to grain legumes as an integral part of a profitable system and to identify those that will benefit the most. Also develop BMP for the movement in / out of cropping / pasture phase. Need technology to establish pasture phase.
	Soils	10	HP	Develop an understanding of how stubble management improves soil water infiltration.	It is understood already that more stubble is better when it comes to soil water management. Growers are not interested in quantifying this in itself; rather more information about how stubble management improves infiltration is required along with education on this point.

GRDC Lines of Business	Subject	No	Rating	Western Downs & Maranoa Priority Issues 2010	Comments
Practices (cont'd)	Soils (cont'd)	11	HP	<p>Increase knowledge of, and develop solutions for, the sub-soil constraints of salinity and sodicity. Develop in-field kits for measuring these constraints.</p> <p>Management options and variety selections that enable growers to deal with salinity and sodicity are required, with an emphasis on chickpeas and legumes.</p>	<p>There is increasing concern that salinity and sodicity are limiting rooting depth. Need an understanding of where in the profile transference of high EC's occurs, vertically or laterally. Research relationship between age of cultivation and salinity. Develop management that accelerates deep movement of salt bulges. Develop threshold CI levels that restrict rooting depth and how to be best interpreted. Establish the degrees of transient salinity & whether this is significantly influencing salt levels in rooting zones.</p>
		12		<p>Develop an understanding of the role of soil biological interactions in improving crop performance. This is an issue for all biological sciences including those relating to the environment and agriculture.</p>	<p>Biological interactions that take place in soils need to be better understood so that informed decisions are made on practices and efficient use of inputs: e.g. how fallow length influences beneficial organisms (e.g. VAM) and how to adjust the effects of crop rotations on biological reactions in soils.</p>
	Nutrition	13		<p>Research into Phosphorus application and response is required.</p>	<p>Deep placement of P fertiliser is believed to be able to produce economic responses under controlled trial situations. Development is required to extend this to field situations including where there are sub-soil or physical constraints. A better understanding of P requirement in legumes is required.</p>
	Diseases	14	HP	<p>Develop BMP for disease control in wheat in a range of cropping systems with particular emphasis on the biology of crown rot.</p> <p>Identify why back-to-back wheat production in some situations is not affected by crown rot.</p>	<p>Crown rot (along with Stripe Rust, Root Lesion Nematode and Yellow Leaf Spot) is a serious disease of wheat and management practices are required to support genetic resistances.</p> <p>We are unaware of any research into the biology of crown rot. Why do some fields not have crown rot & others not?</p>
		15		<p>Disease probe varieties need to be planted around the State to monitor disease incidence and pressure.</p>	<p>These would have an important biosecurity and disease management role. For instance, probe lines that are indicators of the presence of particular cereal rust pathotypes should be planted throughout the State so it is possible to identify potential threats.</p>
	Precision Agriculture	16		<p>Support machinery prototypes which facilitate the adoption of emerging technologies (including PA). This includes improved mechanisation of planters, harvesting, sprayers, etc. to increase product and time efficiency.</p>	<p>Rapidly rising input costs and the shortage of skilled labour are major concerns for grain growers. Greater efficiencies are needed for product application and labour requirements need reducing through means such as semi-autonomous machinery.</p>

GRDC Lines of Business	Subject	No	Rating	Western Downs & Maranoa Priority Issues 2010	Comments
Practices (cont'd)	Weeds	17	HP	<p>Develop best management practice for fallow management to control resistant & 'hard to kill' weeds particularly fleabane and Feathertop Rhodes.</p> <p>Elevate 'detect' technology as an alternative to 'double knock' technology.</p> <p>Monitor other potentially invasive weeds: e.g. rats tail grass and acid grass (<i>Sporobolus coromandelianus</i>).</p>	<p>Zero and minimum tillage systems continue to expand due to improved yield performances. These systems rely on effective herbicide weed control. Growers are concerned that glyphosate will break down thus reducing area cropped and farm incomes. Appropriate counter resistance strategies are required including rotating herbicide groups to prolong life of front-line herbicides.</p> <p>Programs informing growers of "detector sprays" are warranted as this technology offers a quantum leap in weed control in zero tillage systems. Chemical focus needs to be on 'knockdowns' rather than 'residuals' for opportunity cropping.</p>
	Spray Technology	18	HP	<p>Develop BMP & achieve a high level of grower adoption to improve efficacy, reduce usage, avoid herbicide resistance and prevent drift.</p> <p>Refine an understanding of detector sprays.</p>	<p>Herbicide weed control is a critical component of zero till. The adoption rate of BMP is less than desirable which poses social & environmental concerns. Herbicide resistance is a major concern. Need more research on extra coarse droplet technology & rates to achieve efficacy. Programs informing growers of detector sprays are warranted as this technology offers a significant improvement in weed control in zero tillage systems.</p>
	Insects	19	HP	<p>Develop BMP for controlling stored grain insects in on-farm grain handling and storage systems, with an emphasis on controlled aeration and hygiene.</p>	<p>Viable and effective control of stored grain insects is needed, which will preserve Phosphine as a long term insecticide. This may require the accreditation / registration of applicators to ensure responsible use. Need to be able to retro-seal existing silos and evaluate methods.</p>
New Products	Bio-fuels	20		<p>Identify plants that will increase the competitiveness of a viable domestic bio-fuel industry.</p>	<p>The expansion of the domestic feed grain market has been a boost for grain growers. Expanding this option to include an energy market will further market-proof grain demand by having an additional outlet.</p>
	Carbon	21		<p>Undertake research that will best position grain growers to participate in carbon trading schemes and carbon measurement.</p>	<p>The ability to measure and understand carbon management in the grains industry is essential as carbon trading will impact farm cost structures.</p>
	Building products & other high value end-use crops	22		<p>Undertake research which could position high starch grain for use in building products.</p> <p>Develop crops that have a specialist end-use and are therefore high value, and position them to be grown in the WDM region.</p>	<p>The WDM region faces high transport costs, therefore growers are looking for high value crops that will provide better returns than standard crops and varieties.</p>

GRDC Lines of Business	Subject	No	Rating	Western Downs & Maranoa Priority Issues 2010	Comments
Communication & capacity building	Information	23	HP	<p>Develop more effective ways to rapidly transfer R&D outcomes to growers</p> <p>Develop a specific project on collation of information into 'Crop Management Notes' to ensure that research outcomes are rapidly extended to growers for adoption.</p>	<p>There is a serious need to get the results of research to growers so they can make changes if necessary and benefit from the research.</p> <p>E-mails and final project reporting at Grower Updates is one effective way to transfer information to growers.</p> <p>Producer demonstration sites are another example of an effective mechanism to convey information to growers.</p>
	Capacity Building	24	HP	<p>Build the capacity of all segments of the grain industry with particular focus on scientists, agronomists & growers. Mentoring is a key component of capacity building.</p> <p>Succession plans need to be put in place for senior scientists.</p>	<p>A strong grain industry requires all segments to be working at world's best practice. The discovery of new technology and its rapid adoption by growers is vital for a successful grain industry. Successful mentoring could require the appointment a coordinator.</p>

Darling Downs RAC

PRIORITY ISSUES 2010

1. Profile

The Darling Downs region is a traditional grain production area, producing a wide variety of crops on a range of soils generally suited to long-term cultivation. Farming systems are relatively well advanced with opportunities normally presented for both winter and summer cropping and often times double cropping. Generally, the profitability of sorghum is better than that of winter cereals. Increasing interest in high value crops such as cotton and grain legumes has led to a greater need for improved co-ordination in controlling insect pests and minimising spray-drift.

2. DD RAC Membership

Name	Location	Occupation	Position
BERRY Lindsay	Nobby	Grain Grower	Member
BIDSTRUP Wade (Chair)	Warra	Grain Grower	Member
COLEMAN Ben	Mt Tyson	Grain Grower & agribusiness	Member
HORNICK Chris	Cecil Plains	Grain Grower	Member
JOSEPH Chris	Dalby	Grain Grower	Member
PFEFFER Shane	Millmerran	Grain Grower	Member
WARREN Brian	Bowenville	Grain Grower	Member
BURGIS Michael	Toowoomba	Consultant	Member
JORGENSEN Todd	Dalby	Agribusiness	Member
O'MARA Bede	Toowoomba	Agribusiness	Member
SKERMAN Daniel	Dalby	Agronomist	Member
THOMPSON John	Toowoomba	Scientist	Member
FREEBAIRN David	Toowoomba	GRDC	Nominee
WILLIAMS Rex	Toowoomba	DEEDI	Nominee
HOCHMAN Zvi	Brisbane	CSIRO	Nominee
SUTHERLAND Mark	Toowoomba	USQ	Nominee
NEWTON Wayne	Dalby	GRFL	Nominee

3. Crop Importance Profile

Importance Category	Crop	Forecast Change by 2015-18	Comments
Dominant	Sorghum	Stable	<i>Sorghum is the major crop with some concern that it may be over-dominant in the cropping system.</i>
	Wheat	Stable but with increase in feed and decrease in milling focus	<i>Concern that wheat yields have not improved over the years. There has been a shift to supplying the livestock market at some expense of the milling market.</i>
Important	Barley	Stable	<i>Production is focused on supplying the feed market.</i>
	Chickpea	Stable	<i>Chickpea is the main grain legume crop.</i>
Other	Mung Beans	Stable	<i>Considered an opportunity crop requiring specialist management.</i>
	Maize	Potential Increase	<i>Could be some swing from irrigated cotton to irrigated maize.</i>
	Sunflower	Stable	<i>Now a minor crop.</i>
	Millets	Stable	<i>Suited to the lighter northern Darling Downs soils.</i>

GRDC Lines of Business	Subject	No	Rating	Darling Downs Priority Issues for 2010	Comments
Varieties	Sorghum	1	HP	<p>Breed sorghum with :</p> <ul style="list-style-type: none"> ▪ high yield potential ▪ increased standability (stay green), ▪ midge resistance ▪ more stay green available in commercial varieties ▪ a wider planting window, through improved heat and cold tolerance ▪ cold tolerance for emergence ▪ charcoal rot & ergot resistances ▪ good tolerance to moisture & heat stresses ▪ large & uniform seed size ▪ tolerance to imidazolinone (IMI) herbicides 	Sorghum is the dominant regional crop. High yields are targeted for optimum available plant water situations. Lodging continues to be the major production problem. While good levels of midge resistance currently exist in commercial varieties, increased plant resistance is required to eliminate spraying to maintain beneficial insects. Widening the early planting window results in taking advantage of early rain (requiring cold tolerance) & avoiding heat stress at flowering. The presence of small & non-uniform seeds increases processing costs. A genetic solution to managing ergot will widen the planting window. There is increasing concern over charcoal rot from dominant sorghum cropping. Ethanol production based on sorghum is seen as an emerging market.
	Chickpeas	2	HP	<p>Breed chickpeas that are:</p> <ul style="list-style-type: none"> ▪ high yielding ▪ easy to harvest ▪ highly disease resistant; and have ▪ large grain size. 	Chickpea is the main legume crop in the region, and improved varieties are required to ensure it remains an economically viable option in the production system.
	Wheat	3		<p>Breed wheat varieties with:</p> <ul style="list-style-type: none"> ▪ multiple disease and nematode resistances ▪ more tolerance to frosts ▪ improved WUE ▪ longer coleoptile length ▪ qualities suitable for the milling, livestock and industrial markets ▪ lodging resistance and shorter straw <p>Breed durum varieties which must have crown rot resistance.</p> <p>Need market-specific varieties that will offer a premium (since the Darling Downs region has specialist environments). This will also entail some market development work.</p>	Multiple resistances are required for crown rot, rusts and yellow leaf spot. With the high adoption level of zero till, growers need the option to deep plant. Varieties with longer coleoptiles are required. RLN is a major problem for wheat production and plant resistance is required. Widening the planting window with the option of planting in May will reduce production risk. Sprouting from near maturity onwards substantially increases quality risk for milling wheat. Black point & white grain can cause downgrading of milling wheat. Present varieties don't appear to use soil moisture efficiently. With the increasing domestic demand for feed and industrial qualities, the focus should widen to breed for these markets and thus immediately increase yields by removing any milling quality constraints. Some concern exists over the past return on investment for increased wheat yields from breeding.
	Barley	4		Breed higher yielding feed and malting barley varieties with some focus on shorter season types.	Barley is regarded as having reasonable domestic feed demand. Higher yielding varieties are required.
	Maize	5		Breed dryland maize varieties with much greater WUE to compliment sorghum as a major summer cropping option.	There is concern that sorghum is dominating crop rotations leading to an increased incidence of disease. An option of suitable dryland maize varieties will assist viable cropping systems. A maize option will also allow earlier & later planting.

GRDC Lines of Business	Subject	No	Rating	Darling Downs Priority Issues for 2010	Comments
Varieties (cont'd)	Maize (cont'd)				Maize could be a significant emerging crop in the region. Farmers are recording big variations between maize varieties, so field trial evaluations are required to work out why is there a difference. Resilient varieties are required – to help reduce the risk of failure.
	Grain legumes	6		Breed pulses, including mung beans and soybeans, that are <ul style="list-style-type: none"> ▪ easy to harvest ▪ disease R ▪ high yielding. Develop agronomic packages (especially for mung beans) that enable growers to achieve the full genetic potential of grain legume crops.	Grain legumes are an important rotation crops for growers and provide an excellent option for more flexible rotations. There is concern that a lack of information about the agronomy and management of new varieties in <u>specific environments</u> means that growers are not getting the best out of the new varieties.
	GM	7	HP	A GM approach to breeding all crops is strongly supported to compliment traditional breeding technology.	It is felt that improved disease, pest, quality, WUE, etc. traits can be introduced into crop varieties using GM technology particularly for the feed & industrial markets.
	Variety testing	8		Provide independent expert advice on commercial wheat varieties at no less a standard than the DEEDI Wheat Varieties Guide for Queensland (WVGQ).	Growers require independent information on commercial varieties with disease ratings, determined in the production environment, being highest priority. Hard copy information is required. The present NVT program is not regarded as a suitable replacement for the WVGQ.
Practices	Soils	9	HP	Understanding greenhouse gas cycles (including nitrous oxide) and carbon sequestration within current farming systems in anticipation of a possible carbon price.	Although agriculture is not expected to be included in the early stages of an ETS scheme, it will certainly be impacted in the early stages by increases in input costs from areas such as transport and manufactured inputs. Under the Kyoto agreement food is not included for carbon offsets, therefore farmers need to better understand how they might offset higher input costs by other means. This means understanding their greenhouse gas liability and the ways to mitigate such liabilities. We should not look at this issue in isolation. Any consideration needs to include all the environmental parameters: e.g. include soils, water, weeds, fauna and flora under one scheme.
		10		Develop best management practice to maximise crop yields from the interactions of organic matter, sub-soil constraints and soil fertility and for their individual management. This includes the relatively immobile soil nutrients (P, K, Zn) in zero tillage systems.	Growers are interested in managing soil organic matter, particularly under zero till, to achieve productivity gains. Focus is needed on biotic & abiotic constraints to increased yield combined with nutrient management including deep placement and stratification within sub-soli constraints. Advice on crop specific requirements for the immobile nutrients (P, K, Zn) under zero tillage is seriously lacking. An extension effort is required.

GRDC Lines of Business	Subject	No	Rating	Darling Downs Priority Issues for 2010	Comments
Practices (cont'd)	Nutrition	11	HP	Develop and promote best management practice for nutrition for older, intensively farmed soils where natural fertility has declined. This requires better soil and plant tests. A better understanding about phosphorus (non-mobile nutrient) placement is also required.	Old recommendations on nutrient requirements are unlikely to be accurate with higher crop yield targets and improved WUE. Re-examine critical nutrient levels in view of changing practices, costs & prices.
	Insects	12	HP	Develop IPM strategies for the major pests including midge, rutherghlen bug, mirids, aphids and white fly, and for controlling soil-borne insects. IPM to include use of soft options and AWM (mealy bugs could be an emerging issue)	Achieve IPM through breeding host resistance and accepting partial control using banded pesticide and not blanket application. AWM as used in cotton is supported.
		13	HP	Promote the adoption of BMP for stored grain insect control to prolong the use of Phosphine. Alternative insecticides and fumigants are also required.	More grain is being held on farm for longer periods of time and then directly delivered to end users. On-farm BMP is required for the overall industry to prevent the development of phosphine resistance. BMP for phosphine use and the development of alternatives are essential. Serious concern that we are running out of options.
	Weeds	14		Develop integrated management systems for controlling resistant weeds, adopt the most up-to-date spray application technology and extend this to growers through workshops. Weeds of particular concern are fleabane, Feathertop Rhodes grass, barnyard grass, and Urochloa, Management of herbicide resistant weeds is an increasing problem, especially for barnyard grass. Fleabane is also a concern since very few herbicides are registered for its control in our farming system.	An improved approach is needed to weed control management and extension that will preserve chemical effectiveness and reduce the cost of high rate mixes. This needs a whole farm approach to deal with potential resistance. Growers need a better understanding of residual implications of alternative chemicals to reduce pressure on glyphosate. They also need workshops for setting up spray equipment to ensure adoption of latest spray technology and suitable crop rotations. The range of these rotations and their possible impact on the development of resistance should be outlined in an integrated weed control package.
	Nematodes	15		Develop crop rotations to manage nematodes and their interactions with other root pathogens in all crops. Develop improved soil sampling procedures to test for <i>Pratylenchus thornei</i> and <i>P. neglectus</i> .	Nematodes are a major concern for winter crop production and they restrict opportunity cropping decisions. Possibly develop a DNA test.
	Mice	16		Provide options for in-crop mice control while maintaining crop stubble.	A control measure for mice is essential particularly during plagues.

GRDC Lines of Business	Subject	No	Rating	Darling Downs Priority Issues for 2010	Comments
Practices (cont'd)	Crops	17		Determine what is preventing winter cereals (wheat & barley) from reaching their full yield potential (management, genetics, environment – including pests, diseases and climate).	Growers are not getting anywhere near the genetic yield potential even when starting out with a full moisture profile. Yields have apparently 'hit the wall'. Sorghum yields are increasing, but winter cereal yields have flattened out.
	Precision Agriculture	18		Facilitate the adoption of PA by developing a better understanding of variable rate application and the use of remote sensing in crop management. In the longer term use PA technology to do on-farm research.	Although the practical benefits of PA are well understood and the start-up costs are becoming more affordable, there is a lack of expertise or knowledge regarding how to operate this technology. Beyond that there is also a need to understand how to interpret the data and then link this to management changes.
	Spray Technology	19	HP	Improve the understanding of farm chemical requirements, including in relation to spray drift. Develop technologies to effectively manage drift and extend information to applicators through BMP to achieve high adoption levels.	Spray drift remains a major concern to the industry as it increasingly adopts zero till. It is crucial that all operations adopt BMP including OH&S. To date, spray workshop attendance has been poor: somewhat due to timing constraints & some inadequate trainers. The consequence for industry is that important chemicals could be withdrawn or operator licensing imposed.
New Products	Bio-fuels	20		Invest in research to support bio-fuel production from grain with some focus on sub-tropical crops (oilseeds & bio-mass).	This includes both ethanol and bio-diesel particularly for on-farm use.
	New end uses for sorghum	21		Develop specialist sorghum varieties for food and/or pharmaceutical end-uses.	This would provide more options for growers.
	Chickpea inoculation	22		Improved chickpea inoculation technology is required.	Effective ways to applying the inoculant to the seed are required. Information about which inoculants are most effective is required.
	NIR & rapid assessment tools	23		Explore a wide range of applications of NIR to grain growing and marketing including grain protein, variety identification, kernel defects, moisture, starch, etc.	This is a way to extract higher value from the crop when it is marketed.
Communication & capacity building	Mentoring and training	24	HP	Need to mentor future industry leaders for various roles. This includes farmer leaders and supporting professionals who work in RDE. There should not be a requirement for involvement with an Agri-political organization.	Mentoring and providing Professional Development will help develop a skills-base for industry. GRFL is regarded as being in an ideal position for this mentoring, which can be more efficient than scholarships. Need to ensure that grain industry is supplied with high quality personnel to conduct future RDE. There is currently a shortage of young professionals.

GRDC Lines of Business	Subject	No	Rating	Darling Downs Priority Issues for 2010	Comments
	Information	25	HP	<p>Growers, agronomists and consultants need to be able to find information quickly and easily.</p> <p>Hard copy booklets and clear web sites remain vital methods for delivering information to growers and agronomists.</p> <p>Hard copy booklets remain the preferred method for accessing information.</p> <p>Web sites need to be easy to use.</p>	<p>While growers understand the cost benefits of moving to electronic methods, agronomists & growers most often require reference material while in the paddock.</p> <p>Hard copy information format is of particular value for “how to” sorts of information because navigating through large complex websites is still a developing skill.</p>
	Facilitation	26		<p>Build better extension networks.</p> <p>Establish an information facilitation system using local agronomists to organize small grower groups: private and distributor agronomists and major grower organisations play a key role in research extension. Many growers do not participate in generic technical workshops or read research reports but prefer to communicate via small local groups within their area. Therefore beyond the Research Updates provided, these key players (agronomists & grower organisations) should be supported with a well structured professional development program and receive sufficient funding to allow them to run a series of small relevant field days for small local grower groups in their area.</p> <p>An effective model is required to get new and existing information to consultants and agronomists, which should also be designed to help get young agronomists up to speed.</p>	<p>The loss of government extension is of great concern to growers when it comes to gaining information on adopting new practices. Now and in the future there is a need for research information to be facilitated via grower groups, private and distributor agronomists. They should be supported as the main means for stakeholder adoption of research investment. Better training structures and incentives are required to achieve this. There is a need to move beyond ‘updates’ to a more consistent professional development program. Their role would be to deliver information on practices in a way that best suit grower needs.</p> <p>Not all programs would need to be the same – there should be some flexibility for Regional variation.</p> <p>Consideration needs to be given to how to provide extension to growers who aren’t receiving it now.</p>
	Collaboration	27		<p>Need to ensure that there is close collaboration between all RDE agencies (including Catchment Management Associations) for ‘best planning’ and to maximize investment efficiency.</p>	<p>This is a standard way of doing business</p>

South East Queensland RAC

PRIORITY ISSUES 2010

1. Profile

The SEQ region comprises a large number of diversified small farming units that produce a wide variety of agricultural and horticultural crops using a range of farming systems which may include livestock. Crops usually rely heavily on seasonal rainfall as double cropping is widely practised. Untimely rainfall at harvest may affect grain quality. Effective weed control is often more difficult than in other grain producing areas as a result of the intensity of farming systems and reduced opportunities for residual herbicides. Due to the range of crops grown, insect pests can also be more difficult to manage and chemical use is often restricted by urban population pressure.

2. SEQ RAC Membership

Name	Location	Occupation	Position
BIRCH Greg	Kingaroy	Grain Grower	Member
CLARK Colin	Innisplains	Grain Grower	Member
CROSS Julian	Kumbia	Grain Grower	Member
ENKELMANN Peter (Chair)	Murgon	Grain Grower	Member
JORGENSEN Neil	Wondai	Grain Grower	Member
KINGSTON John	Childers	Grain Grower	Member
LEARMONT Wayne	Wooroolin	Grain Grower	Member
ROOK Trevor	Kingaroy	Grain Grower	Member
CROSTHWAITE Ian	Kingaroy	Consultant	Member
HARDEN Patrick	Bundaberg	Agronomist	Member
MCDONALD Andrew	Kingaroy	Agribusiness	Member
SANDERSON Aaron	Ayr	GRDC	Nominee
COLSON Emma	Toowoomba	DEEDI	Nominee
FITT Gary	Brisbane	CSIRO	Nominee
GEORGE Doug	Gatton	UQ	Nominee

3. Crop Importance Profile

Importance Category	Crop	Forecast Change by 2015-18	Comments
Dominant	Peanuts	Possible slight decrease in Burnet with increase along central coast	<i>Peanuts have historically been the dominant crop. High inputs costs may constrain production. The central coast is developing as a key area.</i>
	Sorghum	Possible slight increase	<i>Dominant crop on the black soils and for local livestock markets (grain / forage). Lower input costs.</i>
	Maize	Possible slight decrease	<i>Dominant rotation crop with peanuts.</i>
Important	Wheat	Stable	<i>Wheat is an opportunity crop supplying the local feed markets.</i>
	Barley	Stable	<i>Barley is an opportunity crop supplying the local feed markets.</i>
	Soybean	Possible increase	<i>Culinary soybean production along the central coast is proving successful in rotation with sugarcane.</i>
Other	Mung Bean	Stable	<i>Considered an opportunity crop requiring specialist management.</i>
	Millet	Stable	<i>Opportunity summer crop.</i>

GRDC Lines of Business	Subject	No	Rating	South East Queensland Priority Issues for 2010	Comments
Varieties	Peanuts	1	HP	Breed higher yielding varieties for <ul style="list-style-type: none"> ▪ dryland and irrigated production systems ▪ avoidance of aflatoxin and resistance to foliar diseases (equal importance) ▪ resistances to soil borne diseases, <i>Sclerotinia</i>, white mould, CBR ▪ reduced Cadmium uptake ▪ upright plant for ease of dryland harvest 	Peanuts are the dominant regional crop. Breed a suite of varieties for a wide range of moisture situations, which are either resistant to aflatoxin or avoid the disease. Foliar disease resistance is of huge importance to all peanut growers. Upright plants are required for easier harvesting.
	Grain legumes	2	HP	Breed higher yielding soybean, mung bean, chickpea, navy bean, azuki & pigeon-pea <ul style="list-style-type: none"> ▪ with weathering and disease resistance & quality suitable for high value food markets ▪ combine minor crops into a new minor crop breeding program ▪ must be suited agronomically for irrigated & dryland situations 	Due to their importance in crop rotations there is an ongoing need to increase the yields of grain legumes suitable for the food market. Soybean is increasing in importance along the central coast as a suitable rotation with sugar cane. A critical mass could be provided for minor crops breeding through consolidation.
	Sorghum & maize	3	HP	Breed varieties <ul style="list-style-type: none"> ▪ suitable for dryland conditions ▪ resistance to ergot (sorghum) ▪ suitable for the feed, ethanol & silage markets ▪ resistance to maize diseases 	Sorghum and maize are dominant crops and provide important rotations with peanuts. Forage demand is increasing with expansion of local beef production. Maize/sorghum NUE is an emerging issue.
	Wheat	4		Breed varieties with multi-disease and pest resistance	Resistances required include those for rusts, yellow spot, and soil-borne pathogens including nematodes.
	Barley	5		Breed varieties with multi-disease and lodging resistance	Spot form of net blotch is still a concern.
	Oilseeds	6		Identify oilseeds suitable for bio-fuel production and cropping systems.	e.g. brassicas and peanuts
	Practices	Systems	7		Improve understanding of crop water requirements and how to maximise response in dryland & irrigated crop systems.
8				Adapt the Grains BMP program to cover grain legumes.	Especially for irrigated grain legumes: this could be a module or hyper-linked points off existing Grains BMP documents. Explore the power and flexibility of on-line systems to accommodate variations in farming systems.

GRDC Lines of Business	Subject	No	Rating	South East Queensland Priority Issues for 2010	Comments
Practices (cont'd)	Soil	9	HP	Develop an understanding of the impact (including the economics) of current crop rotations on soil carbon, soil nutrients, and soil biology and provide BMP options to maximise any benefits to be gained.	With the increasing adoption of reduced and zero tillage there is a need to better understand issues such soil carbon, sub-soil constraints, nutrients and biology. With rapid increases in input prices, adoption of optimal rotational practices will improve.
	Nutrition	10	HP	Develop a better understanding of the soil chemistry for <ul style="list-style-type: none"> ▪ K (in all soils) ▪ Mg (in vertisols) ▪ Ca (in acid soils) ▪ soil amendments including mineral fertilisers and provide BMP to maximise crop yields based on this understanding.	With the increasing adoption of reduced and zero tillage there is a need to understand issues such as nutrient availability, stratification, deep placement etc. Need to evaluate the benefits of microbial promoters and mineral fertilisers.
	Diseases	11	HP	Develop and promote BMP to effectively manage <ul style="list-style-type: none"> ▪ aflatoxin (linked with <i>Etiella</i> grub management) ▪ <i>Sclerotinia</i>, white mould, CBR and foliar diseases in peanuts ▪ Pachymetra and nematodes in coastal regions ▪ winter cereal diseases (e.g. barley leaf rust, blotches, etc). 	This includes understanding the biology and control of <i>Etiella</i> grubs. Promote adaptation of BMP practices in high humidity areas for winter cereals.
	Insects	12	HP	Continue support for an IPM approach towards insect management in all crops which promotes AWM Programs.	Programs similar to cotton are required. Soft chemical control of virus vectors and mirids with minimal effect on beneficials; strategies to build up beneficial populations in native pastures.
		13	HP	Provide extension of best management practices for insect control in on-farm stored grain, including early insect detection methods. Promote the need for the adoption of the best management practices throughout the industry. There needs to be hardcopy information about stored grain pest control in Crop Management Notes.	Increasing volumes of grain are being stored on-farm for longer periods of time in varying storage designs. BMP needs to take into account an understanding of QA & conflicts in achieving 'vermin proof' storages and efficient low cost aeration.
		14		Develop new approaches for controlling stored grain insects.	There is major concern over insect resistance to Phosphine, therefore alternative control methods need to be developed. Individual grain growers and bulk grain handlers may require approaches tailored to their specific circumstances and needs.
	Weeds	15		Develop an integrated approach to avoid herbicide resistance: e.g. for herbicides such as glyphosate.	Increasing problems are being experienced in controlling weeds due to resistance. With the introduction of GM crops, it is important to manage them in a way that minimizes the development of resistance.

GRDC Lines of Business	Subject	No	Rating	South East Queensland Priority Issues for 2010	Comments
Practices (cont'd)	Weeds (cont'd)	16		Develop practices to control legume weeds in legume crops.	For example: phasey bean, siratro, lab lab.
		17	HP	Support the registration of 2,4-DB for post-emergence weed control in important grain legume crops.	This must also allow compliance with QA requirements.
		18		Facilitate the expansion of registered chemicals for use with shielded sprayers.	For example: 2,4-DB and glyphosate.
New Products	New Uses	19		Identify nutraceuticals markets for grain crops.	
		20		Support crop development and marketing into new regions (e.g. soybeans on the coast).	Examples are Bundaberg and other coastal areas.
Communication & capacity building	Information	21	HP	Develop a specific project on collation of information in a 'Crop Management Notes' style to ensure that research outcomes are rapidly extended to growers for adoption. R&D projects need to build in a clearly defined extension component. Printed crop notes are still regarded as a high priority. Field days & workshops are also highly valued for effective extension.	There is still a view that a lot of R&D outcomes are not being rapidly extended to growers for adoption. While websites, CDs & DVDs will increase in importance over time they are not presently rated highly for agronomist & grower usage. A new (printed) summary version of 'Crop Management Notes' should be produced every 3-4 years. More detailed version can be produced on DVD and/or the web.
	Facilitation	22		Need grower/consultant groups to provide 'facilitation' capacity.	Grower groups are an effective method for getting information out to farmers. They are an effective way to address a range of issues, including some that just require an extension effort: e.g. <ul style="list-style-type: none"> • stored grain insect control in coastal and inland areas; and • nutrient removal through the removal of harvested grain and stubble in all cropping systems. The groups could also be involved in working out the best agronomic/management approaches for new varieties of minor crops – so that growers in this region can achieve the full genetic potential of these crops.
	Capacity	23	HP	Encourage students to study agriculture to ensure sufficient numbers of professional farmers and scientists for the future. Positive action could include student scholarships; good news stories in the media; prepare an information package for careers officers; more government support for agricultural education.	There is an increasing concern over the downturn in student numbers undertaking agricultural tertiary studies.

North East NSW RAC

PRIORITY ISSUES 2010

1. Profile

The North East region covers the Slopes, Tableland and Coastal areas of northern NSW and is an area of diverse climate representing a wide range of soils and distinctive farming systems. A range of winter and summer cereals, legumes and oilseeds are grown, creating opportunities for safe diversification and generally reliable yields. Livestock are generally an integral part of Tableland Coastal and many slopes farming systems.

2. NE NSW RAC Membership

Name	Location	Occupation	Position
BOWLER Richard	Bithramere	Grain Grower	Member
CHAMEN Richard	Currabubula	Grain Grower	Member
MCKENZIE Peter	Quirindi	Grain Grower	Member
REDFERN Alan	Narrabri	Grain Grower	Member
SMITH Mike	Gurley	Grain Grower	Member
VENZ David (Chair)	Gurley	Grain Grower	Member
BYRNE Rebecca	Moree	I & I NSW	Member
DESBOROUGH Peter	Casino	Consultant	Member
HUNT Jim	Gunnedah	Consultant	Member
PLATZ Greg	Warwick	Scientist	Member
SERAFIN Loretta	Tamworth	Agronomist	Member
THORN Stuart	Goondiwindi	Consultant	Member
WHISH Jeremy	Toowoomba	CSIRO	Nominee
MANNING Bill	Gunnedah	I & I NSW	Nominee
YATES Bill	Garah	GRDC	Nominee

3. Crop Importance Profile

Importance Category	Crop	Forecast Change by 2015-18	Comments
Dominant	Wheat	Milling – Decrease Feed – Increase Durum - Stable	<i>Historically wheat has been by far the dominant crop with milling quality the focus. There is some shift towards supplying the feed market.</i>
	Barley	Malt & Feed – Stable to slight decline	<i>Important crop although currently smaller areas because of low grain market prices.</i>
	Sorghum	Stable to slight increase	<i>Sorghum is an important rotation crop for wheat to manage moisture, diseases & weeds.</i>
	Chickpea	Increasing importance	<i>Growers are looking to increase grain legumes as part of rotations with wheat and barley.</i>
Important	Maize	Slight increase	<i>Improved varieties widening suitability.</i>
	Faba bean	Slight Increase	<i>As for chickpea.</i>
	Soybean	Stable, to increasing	<i><u>Dominant</u> crop on NSW North Coast.</i>
Other	Canola	Slight increase	<i>Bigger potential for rotation with wheat.</i>
	Mung bean	Stable	<i>Opportunity summer crop.</i>
	Triticale	Stable	<i>Important on NSW North Coast.</i>
	Field Pea	Stable	<i>Some interest for expansion.</i>

GRDC Lines of Business	Subject	No	Rating	North East NSW Priority Issues for 2010	Comments
Varieties	Wheat	1	HP	<p>Breed varieties that combine</p> <ul style="list-style-type: none"> ▪ higher yield ▪ qualities for the milling, feed, pasta markets ▪ improved disease resistance profile, including agreeing to more rigid minimum disease standards, especially for the three rusts. Aim for improved number of varieties that also combine RLN, crown rot, YLS resistance. ▪ improved WUE (e.g. more dry weather tolerant as well as ability to yield high in wetter seasons) ▪ improved range of wet weather tolerant varieties. 	The region's main focus is wheat and wheat rotations. Crown rot is a major issue with stubble retention. All varieties must have minimum levels of resistance to stripe, leaf & stem rusts. Yellow spot, crown and common root rots, root lesion nematodes, are traits required in more varieties, together with resistance to the three rusts. Tolerance to frost & salinity, grain weathering and good standability are desirable attributes.
	Barley	2	HP	<p>Breed varieties with</p> <ul style="list-style-type: none"> ▪ higher yield potential ▪ malting and feed qualities ▪ resistance to net blotches, rust powdery mildew and crown rot ▪ reduced screenings ▪ stronger straw, ▪ larger grain. 	Barley is an important option with the ability to perform well in difficult seasons. The Qld breeding program, with a relatively recently appointed breeder, has extremely promising material still a few years off variety release stage. Growers stress importance of retaining the value from this program. Varieties require resistance to spot & net blotches, rusts mildew & crown rot.
	Triticale	3		<p>Breed</p> <ul style="list-style-type: none"> ▪ grain varieties suitable for the NSW North Coast, Tableland and slopes regions (very acid soil tolerant) ▪ high yielding varieties for high yielding environments like the Liverpool Plains ▪ dual purpose varieties for the Western Slopes. 	Triticale is viewed as an excellent winter crop option for the many acid soil types across the region including plains, slopes, tablelands and coast.
	Grain Legumes	4	HP	<p>Breed soybean for the North Coast NSW region as well as for inland irrigation areas that include the following characteristics</p> <ul style="list-style-type: none"> ▪ high quality grain with emphasis on clear hilum ▪ large size, high protein, attractive grain (expanding human consumption markets) ▪ high yield ▪ high weathering tolerance ▪ a range of varieties suited to early, mid and late sowing ▪ improved suite of disease resistance (various fungal diseases) ▪ good agronomic traits like standability, tolerance to manganese toxicity. 	Soybean is the dominant North NSW Coast crop. It fits in well with various crop and pasture systems (winter cereals, sugarcane, maize, beef, dairy) because of rotational and soil N building characteristics. It has good potential to expand in all these systems. There is potential for expansion in inland areas as better varieties released. On the coast it is important to have varieties for early, mid and late planting (different day-length and other requirements) to suit double cropping.

GRDC Lines of Business	Subject	No	Rating	North East NSW Priority Issues for 2010	Comments
Varieties (cont'd)	Grain Legumes (cont'd)	5		Breed improved mung beans <ul style="list-style-type: none"> ▪ more reliable and higher yielding with improved disease resistance ▪ good agronomic traits (e.g. standability, higher pods). ▪ high quality. Identify other suitable summer grain legumes with better WUE for sustainable rotations.	Grain & lay legumes are seen as excellent rotation crops for summer planting windows. Good progress has occurred with mung bean variety development. There appears to be excellent potential for further substantial gains in mung bean variety development.
		6		Breed faba beans <ul style="list-style-type: none"> ▪ higher and far more reliable, stable yield ▪ disease resistance ▪ suitability for dryland systems with improved WUE ▪ reduce lodging ▪ improved harvestability. 	Faba beans show enormous promise as a crop in its own right as well as a rotational crop. However yields are commonly disappointing and don't match biomass. Need for greater promotion of beans as a valuable protein feed for livestock.
		7	HP	Breed chickpeas with: <ul style="list-style-type: none"> ▪ higher yields ▪ RLN resistance ▪ disease resistance (virus, Ascochyta, phytophthora) ▪ suitable for dryland systems with improved WUE. 	Chickpeas are regarded as the main north east inland rotation winter crop for managing soil borne diseases and weeds. Increase the height of the lowest pods.
		8		Evaluate lay legumes (e.g. salt tolerant lucerne, bird foot trefoil) as alternatives to grain legumes in cropping systems.	There are a lot of cropping areas with sodicity and salinity subsoil constraints. Need more options to better utilise these soils.
	Sorghum	9	HP	Breed for: <ul style="list-style-type: none"> ▪ improved adaptation to limited water environments (e.g. stay-green) ▪ Improved yield (seem to have reached a yield barrier) ▪ improved standability ▪ Grain quality attributes better suited to the needs of the livestock industry. 	Sorghum is the dominant broadacre summer crop suitable for dryland production. It is a crucial rotation crop with winter cereals. Avoiding moisture stress, improving standability and digestibility must remain priority breeding objectives.
	Sunflower	10		Breed for improved disease resistances (e.g. rust, alternaria), higher yield, tolerance to some herbicides (e.g. Clearfield type), a range of qualities and good agronomic type.	Sunflower is grown in this region as an opportunity crop. Effective disease resistances are required. Improved varieties should increase popularity and the crops usefulness in the rotation.
	Irrigated wheat	11		Develop varieties with the same agronomic characteristics as dryland wheats, but with additional emphasis on standability, high yield and wet harvest weather tolerance.	Irrigated wheat has a big potential for expansion provided varieties more suited to high yield (e.g. better straw strength) can be developed.

GRDC Lines of Business	Subject	No	Rating	North East NSW Priority Issues for 2010	Comments
Varieties (cont'd)	Dual Purpose (DP) cereals	12		Develop improved disease resistant and higher yielding DP oats, DP winter wheat with improved resistance for the three rusts as well as WSMV and BYDV resistance, DP barley with improved disease resistance as well as DP triticale.	DP crops are grown by most farmers in the eastern and central part of the region. It is possibly most feasible to combine DP breeding of oats with another crop, e.g. triticale. There is currently no Australian focused DP oat breeding. Non-bearded dual purpose wheat is desirable. Growers stress that it is essential to have high levels of rust resistance in early sown DP wheat (otherwise it is a host for later sown crops).
	Other Crops	13		Ensure on-going breeding of alternative crops (e.g. sesame, guar, linseed, safflower), particularly in view of the changing agricultural / climatic environments.	It is important to ensure that 'other' crops (e.g. sesame, guar, linseed, safflower) are not swamped by the higher priority crops.
	GM	14	HP	Use GM and other bio-technology to introduce improved traits such as frost resistance, into crops.	This technology to be used where industry has determined there is a market advantage.
Practices	Systems	15		Continue to assess and monitor the long term effects of tram-tracking & controlled traffic in farming systems and conduct robust systems analysis to accompany BMP for crop sequencing based on long term benefits.	Place more emphasis on the long term economics in the decision making process for determining cropping systems.
		16		Continue the evaluation of mixed farming systems on the northern slopes.	A continuing emphasis needs to be placed on mixed farming RD&E. The challenge is how to best fit zero till/controlled traffic with grazing.
	Soils	17	HP	Improve the understanding of soil biology & determine how to maximise organic matter formation for the benefits of soil micro-organisms and soil surface cover.	Growers are more and more focusing on their soils to understand and to manage them to improve over-all soil health and subsequently long term crop yields.
		18		Develop BMP to increase WUE, taking into account Controlled Traffic, fallow management and tactical tillage.	WUE has the potential to be further improved through better crop sequencing and monitoring. The role of tactical tillage needs acknowledgement for management of weeds, soil biology & nutrient stratification.
	Nutrition	19	HP	Research and develop a better understanding of nutrient stratification (i.e. for P, K, Zn) and nutrient availability to crops in the changing cropping practices (e.g. zero till, controlled traffic) and develop management practices for plant nutrient supply including deep banding, split applications and liquids.	With the move to reduced and zero tillage and cycling of nutrients from deeper in the soil profile to the top soil, coupled with overall higher yields, growers need improved management practices to account for these changes.
		20		Determine critical crop nutrition limits to achieve maximum economic returns.	With higher prices of fertilisers, there is a pressing need to more accurately apply the required nutrient rates to optimise crop yield.
		21		Independently evaluate the benefits of alternative fertiliser forms & their applications.	There is an increasing number of fertiliser products coming onto the market which have no independent scientific validation.

GRDC Lines of Business	Subject	No	Rating	North East NSW Priority Issues for 2010	Comments
Practices (cont'd)	Weeds	22	HP	Develop BMP to optimise control of regional 'herbicide resistant and hard to kill' weeds (e.g. Feathertop Rhodes grass, barnyard grass, fleabane, milk thistle, barley grass (especially important in early sown crops), various brome spp, Lippia, ryegrass and bindweed).	Develop a 'best fit' systems approach to control problem weeds resulting from adoption of new practices such as zero till. Assess crop rotations to better manage weeds & diseases. This will include specific management for 'difficult to control' weeds such as Feathertop Rhodes grass, barnyard grass, fleabane, milk thistle, barley grass (especially important in early sown crops), various brome spp, Lippia, ryegrass and bindweed. BMP to slow the development of resistance and provide strategies to lengthen the lives of existing herbicides such as glyphosate. BMP to select herbicides on basis of expected crop rotation.
	Insects	23		Develop IPM for sunflowers, canola and cereals.	The main insect concern is Rutherglen Bug (sunflowers) and aphids in canola and cereals.
	Diseases	24	HP	Develop BMP for diseases (in particular head scab, crown rot & foliar diseases) in systems which favour stubble retention and therefore fungal build-up. Provide economic thresholds for in-crop fungicide applications to control foliar diseases in winter cereals.	Need to develop BMP to maximise the benefits of moisture accumulation and improved soil biology from stubble retention while controlling plant diseases. Modelling programs based on growth stage are needed to support these economic thresholds.
	Crops	25		Develop individual BMPs for all dominant and important crops for the NE NSW region taking into account the increased variability due to climate change.	
	Machinery	26		Provide specialist RD&E capacity for farm machinery information in areas determined to be of 'highest priority'.	With the rapid move towards new tractor, tillage, planting & spray technologies and the high cost of these investments, independent expert advice is required to balance commercial retail advice.
Communication & capacity building	Information	27		Extend R&D information to growers via large focused field days and grower updates. Hand-out notes with well targeted messages are crucial. Grower updates need to include presentations by experienced growers to 'champion' particular issues.	While it is understood that there are cost savings in the electronic delivery of R&D information to growers, the majority of growers still prefer field days, updates, workshops, hard copy notes for their R&D information.
	Capacity	28	HP	Train & mentor young people in crop science, agronomy and production.	There is increasing concern over skills based 'succession planning' for all segments of the grain industry.
	Machinery IT	29		Provide more IT support for grain growers.	Growers are incorporating more technology into their machinery they require for future. Some tractor cabs are starting to resemble offices with laptops, GPS equipment, etc. IT type support with machinery focus, would be appreciated by growers.

North West NSW RAC

PRIORITY ISSUES 2010

1. Profile

The North West Plains is a major Prime-Hard wheat producing area and more recently, an expanding major producer of cotton and other irrigated crops. Although rain-fed summer crops were once commonly regarded as only marginally suited, they are gradual expanding throughout the region, including in western areas (provided they are grown on stored sub-soil moisture). Soil types are generally dominated by medium to heavy uniform clays.

The capacity to continually keep producing reliable high yielding crops with quality wheat is important to growers in the region. Many grain growers are increasingly striving to develop economic and reliable rotations with crown rot the main threat to wheat production. The adaptability of alternate crops to often-times marginal seasonal rainfall is important.

2. NW NSW RAC Membership

Name	Location	Occupation	Position
BARTELEN Darryl	Talooka	Grain Grower	Member
BRETT Charles	Moree	Grain Grower	Member
CHRISTIE Phil	Bellata	Grain Grower	Member
ONUS Robert	Moree	Grain Grower	Member
O'NEILL Geoff (Chair)	Narrabri	Grain Grower	Member
SLACK-SMITH Andrew	Burren Junction	Grain Grower	Member
YATES Andrew	Garah	Grain Grower	Member
BELL Lindsay	St Lucia	CSIRO	Member
BURLEY Tim	Moree	District agronomist	Member
COLEMAN Brad	Rowena	Consultant	Member
CRUICKSHANK Alan	Warwick	Research Agronomist	Member
MCLEAN Jodi	Walgett	Consultant	Member
PARKER Myles	Walgett	District agronomist	Member
PHELPS Brooke	Moree	Agronomist	Member
YATES Bill	Garah	GRDC	Nominee

3. Crop Importance Profile

Importance Category	Crop	Forecast Change by 2015-18	Comments
Dominant	Wheat	Milling – stable Feed – stable Durum - stable	<i>Historically wheat has been the cropping backbone with milling quality the focus. There is some interest towards supplying the feed market. Crown rot contains durum expansion.</i>
	Barley	Stable	<i>Focus is towards malt quality although feed grade is common. However new varieties could change this focus.</i>
	Sorghum	Increase	<i>Sorghum is an important rotation crop for wheat to manage moisture, diseases & weeds.</i>
	Chickpea	Slight Increase	<i>Growers are looking to increase grain legumes in rotation with wheat and barley.</i>
Important	Canola & Mustard	Stable	<i>Growers looking to increase these crops in wheat rotations.</i>
	Faba bean	Stable, possible increase	<i>Growers interested in increasing production however limited markets area concern.</i>
	Maize	Significant increase	<i>Possibly as companion for cotton. And is being recognised as a more robust dryland crop.</i>
Other	Mung bean	Stable	<i>Opportunity summer crop</i>
	Soybean	Increase	
	Sunflower	Stable	<i>Opportunity crop. Some potential to expand.</i>

GRDC Lines of Business	Subject	No	Rating	North West NSW Priority Issues for 2010	Comments
Varieties	Wheat	1	HP	<p>Breed varieties that combine the following features:</p> <ul style="list-style-type: none"> ▪ crown rot as the main focus ▪ root lesion nematode (especially <i>P. thornei</i>) ▪ resistance to stem, leaf and stripe rust ▪ resistance to yellow leaf spot ▪ higher yield potential ▪ drought tolerance ▪ milling and feed qualities ▪ longer coleoptile and early vigour ▪ improved range of frost tolerant varieties ▪ improved grain tolerance to wet weather ▪ improved standability <p>Using both conventional and GM breeding technologies.</p>	<p>Milling wheat the backbone of NW NSW cropping although there is some shift to producing for the domestic feed markets. Varieties require resistance to crown rot, leaf, stem & stripe rusts, root lesion nematodes, and yellow leaf spot. With moisture stress a common factor, improved drought tolerance is required. High screenings can be a problem with dry finishes resulting in downgrading. The option of longer coleoptile varieties is required to allow plant emergence from deep planting. Crown rot is the major production constraint with management options limited for this environment. Improved frost tolerance, grain wet-weather tolerance and improved standability are also important.</p> <p>Include NGA in varietal trial results and reporting.</p>
	Sorghum	2	HP	<p>Breed varieties with:</p> <ul style="list-style-type: none"> ▪ improved adaptation to the drier NW NSW region ▪ improved tolerance to sub-soil constraints ▪ an extended range of flowering periods ▪ improved standability ▪ more suitable, quicker maturing varieties required. <p>Streamlined variety trialling and reporting are required.</p>	<p>Sorghum is the dominant summer crop, however improved yield stability is required. Breeding needs to take into account the NW NSW environment. NGA needs to be involved in varietal trialling & reporting. Develop varieties suited to new technologies such as double skip row.</p>
	Chickpeas	3	HP	<p>Breed chickpea varieties with:</p> <ul style="list-style-type: none"> ▪ nematode resistance (now highest priority) ▪ improved pod resistance to <i>Ascochyta</i> ▪ maintain or improve resistance to <i>phytophthora</i> and <i>Ascochyta</i> ▪ improved virus resistance ▪ quicker maturing varieties ▪ maintain or improve plant height and pod set ▪ improved tolerance to cold (earlier sowing) ▪ improved yield ▪ tolerance to some herbicides (e.g. Balance). 	<p>Growers are aiming to increase the use of grain legumes and other break crops in their rotations.</p>
	Faba beans	4	HP	<p>Breed faba beans varieties with:</p> <ul style="list-style-type: none"> ▪ improved yield consistency ▪ improved resistance to chocolate spot ▪ improved resistance to frost ▪ improved resistance to rust ▪ improved feed quality. 	<p>Faba beans grow well, often with very high biomass. However yields are nearly always disappointing. A major concern is the need for further market development and promotion (e.g. prime lamb industry). Need to gain inroads into the large domestic feed markets.</p>

GRDC Lines of Business	Subject	No	Rating	North West NSW Priority Issues for 2010	Comments
Varieties (cont'd)	Barley	5	HP	Breed varieties with: <ul style="list-style-type: none"> ▪ higher yield potential ▪ malting and feed qualities ▪ resistance to net blotches, rust and crown rot ▪ malting quality ▪ reduced screenings ▪ stronger straw, ▪ larger grain. 	Barley is an important option with the ability to perform well in difficult seasons. The Qld breeding program, with a relatively recently appointed breeder, has extremely promising material still a few years off variety release stage. Growers stress the importance of retaining the value from this program. Varieties require resistance to spot & net blotches, rusts & crown rot.
	Canola & Mustard	6		Breed varieties more suited to NW NSW cropping environment.	Canola & mustard represent potential options for managing crown rot in winter cereals. Current varieties are not yet suitable. Continue the development of a Clearfield type canola.
	Durum	7		Breed varieties with: <ul style="list-style-type: none"> ▪ crown rot resistance ▪ a longer growing season. 	Durum production is declining due to its susceptibility to crown rot.
	Mung beans	8		Breed mung bean varieties with: <ul style="list-style-type: none"> ▪ better adaptation to NW NSW ▪ improved disease resistance ▪ improved grain quality ▪ the potential to provide better stubble cover. 	Mung beans are an excellent short summer season opportunity crop.
	Pulses (e.g. field peas, faba beans)	9		Collate information regarding the feed value of various pulses and their suitability for various markets (e.g. prime lamb, feed lot). Facilitate promotion of value of these grains for various markets. Investigate if there are knowledge gaps regarding the market value of NW pulses.	As the growth of crops like faba beans expands, there is a need for new markets to also grow. General feeling that there is a lack of appreciation of the value of crops like faba beans in industries such as livestock supplementation.
	Cereals	10		Continue cereal phenology trials to keep APSIM current and assist agronomists better refine sowing windows for specific varieties.	Important for modelling, sowing strategies.
	GM	11		Support a GM breeding approach to improve the yield and quality of all dominant and important crops for NW NSW.	For grain growers to remain internationally competitive they require access to all emerging breeding technologies where clear benefits can be demonstrated and there is grower agreement.
Practices	Systems	12		Further refine APSIM for NW NSW areas including taking APSIM on-farm for grower use on initiatives such as managing soil water.	
		13		Develop cropping systems to include a pasture phase for situations where high-cost inputs are not appropriate.	The focus should be on appropriate pasture legume mixes (perhaps combined with subtropical grasses) and how to effectively establish and manage them.

GRDC Lines of Business	Subject	No	Rating	North West NSW Priority Issues for 2010	Comments
Practices (cont'd)	Soils	14		Understand and determine the benefits of managing soil biology to improve crop yields and develop practices to deliver these benefits. Compare these benefits to those from more traditional practices.	Growers are interested in understanding their soils and how various management options can increase yields. The effects and management of soil biota are gaining in importance. The benefits of 'compost tea' and other alternative products are being promoted and there is a need for sound assessment (not provided by suppliers).
		15	HP	Build growers' capacity to improve the understanding of the importance of Plant Available Water (PAW) and Sub Soil Constraints (SSC), and provide management options for overcoming high chlorides and sodicity on a paddock by paddock basis.	Further survey soil testing on the western plains is required to characterise soil properties. BMP is required for these soils. The severe yield penalty from salinity, sodicity & other constraints needs better understanding. This includes measuring actual PAW. Probes are not used consistently and hence are not accurate for determining moisture (e.g. sodic soils appear full). Training, extension & probe improvements are needed.
	Nutrition	16	HP	Investigate innovative forms of fertilisers, P and N delivery, including split, deep placement and liquid applications.	Little research exists in NW NSW, especially in regard to P delivery (e.g. liquids).
		17		Determine the Zn requirements of crops and how best to get an economic response to in-crop application.	
	Crops	18	HP	Improve marketability of faba beans. Facilitate expanding market appreciation of faba beans. Further refine BMP for faba beans to improve yield reliability.	Growers need to increase the amount of grain legumes in cropping systems to control winter cereal crown rot and weeds. Use successful growers to develop BMP for faba bean production. Markets have been problematic and limited.
		19		Develop and extend management practices to increase the adoption of grain legumes in the cropping system.	For sustainable cropping, growers need to increase the percentage of grain legumes in their systems to 20 to 25%.
	Spray drift	20	HP	Ensure new legislation is appropriate and of value to grain growers (e.g. non practicality of 300m buffer zones) Strong legislation to enforce sound herbicide practice (e.g. severe penalties for spraying against label and sound practice such as aerial use of some products, especially adjoining vulnerable crops such as pulse and cotton). Increase education and extension of sound spray practice. To include more effort into education of resellers, property employees, managers as well as owners.	Spay drift from inappropriate use remains an enormous problem with growers aware of "cowboys". Severe penalties would act as a strong deterrent (not currently the case). More education of all participants (including resellers) is required.

GRDC Lines of Business	Subject	No	Rating	North West NSW Priority Issues for 2010	Comments
Practices (cont'd)	Weeds	21	HP	Develop management practices to provide an integrated approach to weed management to prevent the development of herbicide resistance and to control 'hard to kill' weeds.	Weed control particularly under reduced / zero tillage is becoming more difficult. An integrated approach is required. Weeds include fleabane, sow thistle, barnyard grass and phalaris. Resistance to group A herbicides is especially critical. Extend BMP to growers through workshops.
New Products	NIR	22		Further develop NIR and other techniques for cost effective, in-field measurement of available stored soil moisture.	Current technology not favourable for easy farmer and agronomist evaluation of available stored soil moisture. Maybe technology that allows drive-through (electronic magnet assessment?) measuring, calibrated for specific soils.
	Variety identification	23		Develop legally sound and relatively time efficient (as well as cost efficient) cereal variety identification.	This is vital for fair royalty collection, farm monitoring of crop purity, accurate identification re varieties for specific markets. It is a major industry concern, especially if Australia is to retain and capture high-value end markets.
Communication & capacity building	Facilitation	24	HP	Support the formation and facilitation of grower groups.	Grower groups are regarded as an excellent vehicle for achieving rapid technology adoption. To remain highly effective these groups require individual 'facilitation'.
		25		Evaluate the feasibility and profitability of farmer adoption of new technology such as controlled traffic, variable rate, yield mapping, precision agriculture.	High expense, large changes. Where is it appropriate and where is it not (e.g. scale of operation)? Are all aspects value for money?

Central East NSW RAC

PRIORITY ISSUES 2010

1. Profile

The Central East is a traditional farming region with a generally relatively safer rainfall pattern for winter crops, which include mainly cereals but also pulses and oilseeds as break crops. Farming systems often include a pasture phase and dual purpose winter cereals are popular with many (but not all). Lucerne and subtropical grasses are common pasture components. Summer crops are important in parts of the region.

2. CE NSW RAC Membership

Name	Location	Occupation	Position
CONN Mark	Wellington	Grain Grower	Member
EVANS Garry	Geurie	Grain Grower	Member
HASSALL James	Gilgandra	Grain Grower	Member
KELLY Angus	Wongarbon	Grain Grower	Member
MCFADYEN Andrew	Coolah	Grain Grower	Member
ORD Anthony	Coolah	Grain Grower	Member
SULLIVAN Dan	Mendooran	Grain Grower	Member
WALTERS Craig	Elong	Grain Grower Agribusiness	Member
YOUNG Andrew	Purlewaugh	Grain Grower	Member
HERTEL Kathi	Dubbo	Agronomist	Member
SAWLEY Tim (Chair)	Merriwa	Agronomist	Member
STREET Maurie	Dubbo	GOA research	Member
McCAFFERY Don	Orange	I & I NSW	Nominee
CLARK James	Anambah	GRDC	Nominee

3. Crop Importance Profile

Importance Category	Crop	Forecast Change by 2015-18	Comments
Dominant	Wheat	Milling: Stable Feed: Increase Durum: Stable	<i>Wheat is the dominant crop with milling quality the priority. There is an increasing interest in producing for the feed market. Winter wheat varieties for dual purpose options are preferred by many growers.</i>
	Barley	Malting: Stable Feed: Increase	<i>Barley is also a dominant crop with the main focus on feed quality. Again dual purpose varieties are preferred by many growers.</i>
	Canola	Stable to increasing	<i>Canola has been the preferred rotation crop with winter cereals for disease and weed control. Recently crop performance has suffered. Dual purpose canola is receiving increasing attention.</i>
Important	Chickpea	Possible Increase	<i>Chickpea is being grown as a rotational crop with winter cereals.</i>
	Lupin	Possible Increase	<i>As for chickpea.</i>
	Field Pea	Stable	<i>As for chickpea.</i>
	Sorghum	Stable	<i>While the region is considered a winter cropping area sorghum is regarded as an important rotation crop in summer.</i>
Other	Triticale	Stable	
	Maize	Stable	<i>Small pockets of irrigated maize.</i>

GRDC Lines of Business	Subject	No	Rating	Central East NSW Priority Issues for 2010	Comments
Varieties	Wheat	1	HP	<p>Develop wheat varieties that combine</p> <ul style="list-style-type: none"> ▪ milling grade quality ▪ increased wheat streak mosaic virus resistance ▪ higher yield and improved drought tolerance ▪ improved disease resistance profile, especially rusts (3), yellow leaf spot, crown rot, RLN ▪ improved frost tolerance ▪ grain with tolerance to wet harvest conditions. 	Wheat is the dominant crop in the region. While the focus has been on milling quality up to AH in the region, there is increasing interest in producing for the feed market.
	Barley	2		Emphasis on malt varieties is desirable. Develop varieties with improved disease resistance profile (net blotches, powdery mildew), large consistent grain, ability to finish under trying conditions, and good straw strength.	Barley is an important crop that tends to depend more on northern developed varieties. Feed is commonly the main crop but this is more by default than by design.
	Dual Purpose (DP) cereals	3	HP	Develop improved disease resistant and higher yielding DP oats, DP winter wheat with improved rust (3) resistance, DP barley with improved disease resistance as well as DP triticale.	DP crops are grown by a large number of farmers across the region. It is possibly most feasible to combine DP breeding of oats with another crop, e.g. triticale. There is currently no DP oat breeding program in Australia. Non-bearded dual purpose wheat is desirable. Growers stress that it is essential to have high levels of rust resistance in early sown DP wheat (otherwise it is a host for later sown crops).
	Chickpeas	4		Improved virus tolerance. Improved RLN tolerance	A potentially more important crop with some good results since Ascochyta and phytophthora resistant varieties released.
	Lupins	5	HP	Breed Albus lupins with a shorter growing season (10 to 14 days less), as well as better standability and less prone to shattering.	Grain legumes are considered the most effective solution to winter cereal disease control. Resistances to mainstream diseases are considered essential. Lupin's small sowing window would expand if faster maturing varieties were available.
	Field peas	6		Quick maturing, disease resistant (e.g. bacterial blight, powdery mildew), strong standing, non pod shattering varieties required.	While considerable variety improvement is occurring, improved disease resistance and agronomic attributes are needed in future varieties
	Canola	7	HP	Develop canola varieties with improved oil content and sclerotinia resistance. Improved frost tolerance is required. Develop and continue to explore the role of dual purpose canola varieties in the region.	Canola is considered a good rotation with winter cereals for disease and weed control. However performance so far has not been reliable. While current varieties are successfully used for DP use, a specific (e.g. with winter habit) dual purpose variety is probably required for best DP opportunities.
	Triticale	8		Breed dual purpose triticale: long season, 3 rust resistant, and vitreous grain.	Vitreous grain is needed for improved stored grain insect control.

GRDC Lines of Business	Subject	No	Rating	Central East NSW Priority Issues for 2010	Comments
Practices	Systems	9		Update and further develop BMPs to introduce additional crops into sustainable winter cereal cropping systems, including: <ul style="list-style-type: none"> canola in zero till systems under high trash levels Grain legumes (chickpea, lupin, field pea) as viable cropping options for disease breaks & nitrogen fixing. 	Additional crops are required in the winter cereal system to manage winter cereal diseases, weeds & nutrition. Determine practices to reduce poor plant establishment & vigour in canola growth in wheat stubble under zero tillage (research has identified some of these issues). Grain legumes are seen as excellent rotations for break crops with winter cereals. However more effort is required to develop BMPs for each individual grain legume crop.
	Climate	10	HP	Provide growers with more accurate medium term (10 day) and seasonal forecasting, targeting an accuracy level of 70% or better in terms of rainfall.	
	Canola harvest	11		Support and continue current ongoing research assessing various canola harvest timing studies.	Ongoing GOA research indicates a considerable change is required in harvest protocols (e.g. timing of windrows).
	Soil	12	HP	Research and extend a better understanding of sub-soil constraints and extend this to growers.	Preliminary research indicated sub-soil constraints (e.g. acidity, salinity, sodicity) are more widely spread than appreciated).
	Insects	13	HP	Support ongoing and required research to develop BMP incorporating Economic Threshold Levels to control pests including: <ul style="list-style-type: none"> aphids in canola, from stem elongation to pod fill mites in winter cereals, grain legumes & oilseeds (especially BOM, where 4 different strains have been identified, all with different insecticide tolerances) thrips in grain legumes heliethis in lupins and chickpeas. 	Preliminary GOA studies indicate aphids cause far more damage than previously realised. Need for ongoing research to confirm. BOM research was never concluded. Need a quick assay test to identify strain and research to identify the best control strategy. Other pests include false wireworm, slugs, and diamond back moths.
	Diseases	14		Support ongoing research into wheat streak mosaic virus (WSMV) resistant wheat and the development of BMP for control of WSMV including using triticale as a break crop to control leaf curl mite.	WSMV is a potentially serious disease but current research, if seen through (especially breeding) appears to have the issue under control.
		15		A greater understanding of the effect Nematodes have on CE cropping systems.	Northern research indicates nematodes combined with crown rot have contributed to many cases of substantial yield loss this past season. Need to investigate if this also is the case in the central NSW areas.

GRDC Lines of Business	Subject	No	Rating	Central East NSW Priority Issues for 2010	Comments
Practices (cont'd)	Precision Agriculture	16		Determine ways to collect accurate, real time data for soil moisture & soil fertility – to make use of PA technology.	While it is understood that the technology is available for the variable application of inputs, until accurate real time data can be recorded this technology has limited benefits.
	Weeds	17	HP	Upgrade extension efforts throughout the region to minimise, and where possible avoid, the ever increasing threat of weeds developing resistance to herbicides.	A number of important weeds (e.g. windmill grass, rye, wild oats) have been identified in the region with resistance to specific herbicides.
		18		Improve efficiency of “weed seeker” technology where heavy stubble loads exist.	This is a developing issue with “weed seeker” technology, especially as heavy stubble loads increase.
		19		Assess the economic value of variable rate and precision agriculture technology.	While adoption rates are increasing, there is concern from some adopters as to the value of some of this technology, and as to how to better use the information.
New Products	Bio-diesel	20		Invest in research to assist the commercial development of a domestic bio-diesel industry based on grains.	
Communication & capacity building	Information	21		Hold field days to transfer R&D to growers & engage agribusiness & consultants to increase grower participation. Field days need better promotion.	Field days are still regarded as the most effective means of getting new messages to growers. The support of the private agribusiness sector needs to be engaged.
		22		Improve the use of media for transferring R&D information. Place more focus on short and regular updates relating to the particular season.	This includes the Country Hour and Landline, local media (TV, radio & newspapers).
		23		Regularly update farmers and agronomists of the logic and consequences of various proposed carbon trading or similar possible proposed carbon schemes as pertaining to agriculture	Clear logical regular updating of carbon issues is important for agriculturalists and is currently fragmented and difficult to fathom out.

Western Plains NSW RAC

PRIORITY ISSUES 2010

1. Profile

The Western Plains region is a traditional mixed farming region characterised by a wide range of soil types. Its rainfall pattern is slightly summer dominant with huge variability from season to season (as in most of Australia). The main crops are winter cereals, with increasing interest in winter rotational crops and summer cropping. Farming systems often include a pasture phase, namely lucerne, which is grazed by sheep and cattle. Growing interest in subtropical grasses is also occurring on mixed farm properties.

2. WP NSW RAC Membership

Name	Location	Occupation	Position
FISHER Simon	Nyngan	Grain Grower	Member
HARVEY Tom	Dubbo	Grain Grower	Member
JORDISON Darrel	Gulargambone	Grain Grower	Member
MCKAY Mal	Trangie	Grain Grower	Member
MCKAY Mark	Trangie	Grain Grower	Member
O'BRIEN Greg	Gulargambone	Grain Grower	Member
TAYLOR Henry	Gulargambone	Grain Grower	Member
WASS Hayden (Chair)	Nyngan	Grain Grower	Member
WILLIAMS Anne	Coonamble	Grain Grower	Member
BROOKE Greg	Wellington	Scientist	Member
HEUSTON Penny	Warren	Consultant	Member
MULDOON Campbell	Narromine	Consultant	Member
NICHOLSON Steve	Forbes	Consultant/Farmer	Member
STREET Maurie	Dubbo	Consultant/Research	Member
BRILL Rowan	Coonamble	I & I NSW	Nominee
MCCAFFERY Don	Orange	I & I NSW	Nominee
JENKINS Leigh	Warren	I & I NSW	Nominee
HEATH Richard	Milroy	GRDC	Nominee

3. Crop Importance Profile

Importance Category	Crop	Forecast Change by 2015-18	Comments
Dominant	Wheat	Milling – Stable Feed - Increase	<i>Wheat is the most dominant crop with milling quality the main quality focus. Some increase in feed quality production is forecast.</i>
	Barley	Feed - Increase	<i>Increasing interest in feed quality barley, but with new varieties malt is a growing option.</i>
Important	Lupin	Increasing	<i>Increasing interest in lupin.</i>
	Canola mustard	Stable/increasing	<i>Important rotation with wheat.</i>
	Chickpea	Increasing	<i>Important rotation with wheat.</i>
	Field Pea	Stable	<i>As for chickpea.</i>
Other	Faba Bean	Stable/increasing	<i>As for chickpea.</i>
	Sorghum	Increasing	<i>Growing interest, especially in north.</i>
	Triticale	Stable	<i>Increasing dual purpose role</i>

GRDC Lines of Business	Subject	No	Rating	Western Plains NSW Priority Issues for 2010	Comments
Varieties	Wheat	1	HP	<p>Breed a range of maturity types with emphasis on combining good milling quality with resistance to the three rusts, improved crown rot tolerance, yellow leaf spot resistance, RLN tolerance, long coleoptile length, improved drought tolerance and consistent larger grain size.</p> <p>Long coleoptiles are preferred.</p> <p>Improved frost tolerance is an important goal.</p> <p>Improved tolerance to grain wet weather tolerance is an important goal.</p>	Wheat is the dominant crop. Wheat varieties need to cover a wide planting window (short to long season), multiple resistance to diseases (i.e. rusts, yellow leaf spot, crown rot, wheat streak mosaic virus), high stubble level & longevity, good seedling vigour, longer coleoptile & weathering tolerance (sprouting & black point), drought resistance and low screenings. Improved tolerance to frost is also critical.
	Barley	2		Ensure the WP region is covered by the national barley program. New lines from the Qld program look particularly suited to the region	Barley is an important regional crop. Need to update varieties for disease resistance (e.g. powdery mildew), large consistent seed size, good standability, ability to finish in a dry hot end of the season, and avoid lodging in a good season. Malt quality would be an advantage.
	Chickpea	3		Improved tolerance to virus and RLN. Improved ability to flower and set seed early (commonly cooler conditions). Continue with successful breeding program.	An increasingly important crop. In order to manage winter cereal diseases, weeds & nutrition, there is a need to increase the level of grain legumes and oilseeds into the rotations.
	Field Pea	4		Improve the range of early maturing disease resistant (bacterial blight, powdery mildew) varieties with good standability, shatter tolerance and high yield.	An important crop in some parts of the region, with potential for further substantial growth.
	Canola mustard	5		<p>Improve knowledge of how to overcome low oil content in western areas.</p> <p>Improve oil content in western climates.</p> <p>Improve profitability of canola in western regions.</p>	Canola and mustard producers are regularly confronted with low oil percentage in western parts of the region.
	Lupins	6	HP	Accelerate the release of an Albus lupin suitable for shorter growing seasons. Improve standability and tolerance to shattering. Improve <i>Heliothis</i> resistance.	An important crop. Earlier maturing types would improve reliability and grower acceptability.
	Dual purpose (DP) wheat, oats, barley and triticale	7		Breed improved dual purpose oats, winter wheats and triticale (need to specify in what environmental conditions). Require improved rust tolerance as well as improved performance for both grain and grazing.	Currently there is no dual purpose oat breeding program in Australia. DP cereals are an important option for mixed farmers throughout the region. Possibly most feasible to combine DP oats with a program like DP triticale.

GRDC Lines of Business	Subject	No	Rating	Western Plains NSW Priority Issues for 2010	Comments
Varieties (cont'd)	Variety Information	8		Support independent testing of all varieties with information available on the GRDC website & in Ground Cover & a summary of the top performers to be published by end of March each year. Growers, through the RACs, to be consulted on the number & location of trial sites.	As pedigree crop breeding moves towards commercialisation, there is an increasing need for key varietal information to be determined and published independently of the 'private' breeders. Publish a summary of NVT Northern Region results in Ground Cover.
	EPR	9	HP	Support the EPR steering committee as they seek to improve grower participation as well as compliance with EPR collection.	Growers are mindful of the need to support EPR. A consistent view is that compliance will be higher if the high, up-front seed royalty is replaced (substantially) by an EPR payment. The committee supports the trial using National Grower Registration to communicate with growers.
Practices	Systems	10		Determine the benefits of pasture leys & forage crops (including dual purpose cereals and canola) for the viability of long term cropping.	To include red soils and short phases (e.g. 2 years). Take into account the biological and economic advantages of a whole farm approach. BMP for lucerne to optimise soil water and N levels in the final ley stage. Forage crops are seen as a viable option for managing crop diseases & herbicide resistance.
		11		Develop BMP for soil cover throughout the cropping phase, based on the economics of increased crop yields. Improve grower understanding of techniques to maximise fallow efficiency.	For example, the use of millets or not, careful stubble grazing (but not impinging on sound weed control), what is the most desirable level of stubble cover. While a well recognised and appreciated cropping issue, there remains a large percentage of the crop where fallow management is sub-optimal. Issues like herbicide rather than grazing for weed control, how much stubble to retain and how to retain it (configuration) are typical issues. Sub-soil constraints also remain a significant knowledge deficit area, research and extension wise.
	Nutrition	12	HP	Research and refine BMP for crop micro- & macro-nutrition for each soil type, including a practical soil testing procedure and assessment of possible more reliable soil tests (e.g. northern sugar soil test). This includes continuation of fertiliser studies on various row spacing and fertiliser placement configurations.	There remain many unknowns to determine the most profitable nutrient requirements. BMP needs to include the timing and placement of N fertiliser forms. Different row spacing and fertiliser delivery affects yield. Improved knowledge of P, N, K, Zn and Cu requirements is a priority.
		13		Assess the role of 'alternative' fertilisers and additives to improve soil health and yield (including brown coal humates). Provide regular educational advice re how to choose an appropriate fertiliser (e.g. GRDC updates).	Growers are constantly bombarded by advocates of these products so they need a scientific evaluation of the cost / benefits of additives being promoted on the market.

GRDC Lines of Business	Subject	No	Rating	Western Plains NSW Priority Issues for 2010	Comments
Practices (cont'd)	Frost	14	HP	Accelerate the release of frost tolerant crops, especially wheat. Increase understanding of soil moisture levels and frost susceptibility and why western areas tend to be more susceptible to a mild frost than eastern areas. Has such knowledge lead to management for frost avoidance.	Frost is a regular cause of major yield loss. It is speculated that a close relationship between low soil water, stressed crops and spring frost damage.
	Diseases	15		Improve knowledge of control of Sclerotinia & Rhizoctonia in broadleaf crops.	Improved understanding of controlling Sclerotinia & Rhizoctonia in broadleaf crops requires consideration.
	Weeds	16	HP	Continue to research, develop and promote adoption of BMP for weed control with a focus on preventing the development of herbicide resistance, and how to control difficult weeds like windmill grass, barnyard grass, fleabane, milk thistle.	The threat of herbicide resistance is increasing (an extension role). Research into control of difficult weeds remains a high priority. Effective & robust management options are required particularly for conservation farming practices. Pursue label modifications to extend chemical effectiveness. Glyphosate resistance is a major concern. Extend grower awareness of new chemical groups. Non chemical control options to be included in studies and extension.
	Lupin harvest	17	HP	Test techniques to improve and reduce harvest losses from lupins.	Lodging and shattering are a big cause of regular yield loss in this environment with hot and commonly rapidly drying conditions. Desiccation, harvest attachments, earlier harvest, perhaps chemicals, as well as variety development need investigating. Improved extension of existing information.
	Canola mustard	18		Write an updated growing guide for western environments. It should include nitrogen management, sulphur requirements (including value of soil depth analysis), and sowing time (window). Update pest (e.g. aphids) thresholds.	Knowledge gaps when it comes to aspects such as the desirable sowing window and nitrogen management in harsher environments.
	Crop rotations	19		Improve knowledge of the role of break crops in the wheat rotation. A better understanding of crown rot control (one break crop is commonly not working consistently) and technology to improve control.	Lupin, field pea, canola, mustard and chickpea represent the key options for further development. Presently winter grain legumes are not sufficiently suitable for more universal inclusion as rotation options. Current crop options do not enable sufficient relaxation in the disease problems in wheat.
	Crop growing guide	20	HP	More timely release of NSW I & I winter crop growing guide. As far as is possible fill gaps in attributes of varieties as detailed in the growing guide (e.g. many varieties have no information regarding several important variety attributes).	This is an extremely valuable "bible" for growers and agronomists. A release each year around mid-March is commonly after major decisions regarding variety choice have been made. Maybe a requirement should be that trials are statistically analysed and available to authors far earlier (need to set tighter deadlines). Increase pressure (GRDC) on supplier of varieties to supply accurate variety attributes.

GRDC Lines of Business	Subject	No	Rating	Western Plains NSW Priority Issues for 2010	Comments
Practices (cont'd)	Crop physiology education	21	HP	Educate growers on important crop physiology characteristics possibly via a workshop format.	Courses that detail crop physiological attributes (e.g. vernalisation requirement, temperature water interactions, crop response to nutrients like P and N) assist farmers better assess many crop decisions.
	Precision Agriculture	22		Support field days / workshops for agronomists and growers to inform them of the practical aspects of PA.	
	Machinery	23		Continue to support ongoing independent reviews of seeders for conservation cropping including a comparison of discs versus tines.	Identify ways to improve the management of inputs to reduce costs. Need ongoing evaluation of seeders for heavy stubble situations. Careful use of grower case studies can assist.
		24	HP	Facilitate and promote independent review of 'detect-type sprayers' to improve benefits. Support further research to improve efficiency of 'detect-sprayers': e.g. operation under dusty conditions, heavy stubble loads.	'Detect-type sprayers' are providing a quantum leap in managing herbicide application. Given the high start-up cost, more independent performance information and technology updates are required.
New Products	Grain Legumes	25		Support initiatives that help develop new markets for lupin, field pea & faba bean.	Sustainable cropping systems depend upon product profitability as well as beneficial agronomic advantages. Markets for these grain legumes require expansion to increase grower adoption (e.g. domestic prime lamb industry).
Communication & capacity building	Information	26		Accelerate the transfer of information from R&D projects to growers by continuing with the production of hard copies of the NSW I & I Crop Sowing Guide, using CDs and re-introducing hard copies of the Results of Crop Trials.	The rapid adoption of new R & D technologies is viewed as a high priority. The traditional means of transfer are still regarded as being much more effective than electronic means.
	Fallow efficiency	27		Greater extension of issues affecting fallow efficiency and its consequences on profitability.	Issues like ground cover, early weed control, sub-soil constraints, While they are somewhat understood across the region, a better understanding of these issues will improve the profitability of the region.
	Projects Information	28		GRDC Website upgrade to provide more comprehensive access to annual reports, final reports, progress reports, past research and current projects is supported. Selection of RD&E projects on an individual location basis is supported.	

North Queensland

PRIORITY ISSUES 2010

Note: The following information has been kindly provided by Michael Hughes, Extension Agronomist, Kairi Research Station, Queensland Primary Industries and Fisheries, Department of Employment, Economic Development and Innovation.

1. Profile

Unless planted under irrigation the late arrival of planting rains saw both peanut and maize crops being planted later than normal in North Queensland. Those peanut crops planted under irrigation had a good start have grown well. Fortunately for later planted peanut crops, both January and February had plenty of sunshine hours allowing crops to grow rapidly. Lengthy wet and overcast weather in March/early April has seen heavy leaf spot infections, requiring producers to remain on top of their spray programs. Possibly this would have been a good year to trial newly developed short duration peanut varieties such as Tingoorra (due to be released later in the year).

Maize crops are expected to be average this year with yields in the vicinity of 7.5 t/ha expected. Fortunately polysora rust has not materialised indicating that genetic resistance remains effective. Most plantings on the Tablelands were of GRDC/DEEDI developed hybrids, AT1 and AT2, accounting for at least 90% of the estimated 4000 ha planted. Next season should see the introduction of AT3 which has yielded 7% more than the other AT varieties. Use of silage maize has continued to increase in popularity as the large biomass and high grain content of the GRDC hybrids is more widely appreciated. A potential new development is the local chicken industry sourcing white grain maize. The GRDC/DEEDI program has elite white grain inbreds from previous testing which could readily produce satisfactory commercial hybrids if the interest reaches commercial reality.

2. Crop Importance Profile

Importance Category	Crop	Forecast Change by 2015-18	Comments
Dominant	Peanut	Increase	<i>Newer disease resistant varieties requiring less rigorous fungicide timing and applications will make this crop more attractive.</i>
	Maize	Possible slight increase	<i>New hybrids are making the crop more attractive to grow. Expansion of feedlots in the region will increase demand for grain crops. Burdekin district may see an increase to compensate for the reduced production of processing corn in the Mareeba Dimbulah Irrigation Area.</i>
Important	Sorghum	Slight increase	<i>Predominantly grown south west of the Atherton Tablelands. Production may increase with increase in feedlots in the region.</i>
Other	Lupins	Possible slight increase	<i>Production may increase with increase in feedlots in the region, although quality issues may need attention</i>
	Wheat	Possible slight increase	<i>Production may increase with increase in feedlots in the region.</i>
	Other feed grains	Possible slight increase	<i>Production may increase with increase in feedlots in the region.</i>

GRDC Lines of Business	Subject	No	Rating	North Queensland Priority Issues for 2010	Comments
Varieties	Peanuts	1	HP	Breed peanut varieties suitable for the north Queensland environment.	Improved varieties with good leaf disease resistance and storage capability are being developed. Short duration varieties such as Tingoora have shown a possible role in northern farming systems.
	Maize	2	HP	Breed maize varieties suitable for the north Queensland environment.	New varieties being bred have shown record increased yields in trials. Polysora rust and Rhizoctonia sheath rot remain concerns.
Practices	Crops	3		Develop Best Management Practices for peanut production Develop Best Management Practices for maize production	New varieties in particular those with shorter growth periods will need suitable agronomic practices to maximise yield. Some benefit of using twin row planting configurations has been shown For future advancement.
	Irrigation	4		Develop irrigation scheduling for most profitable yields and determine suitability for different farming systems.	The number of northern growers using Aquaman has increased slightly.
	Weeds	5		Develop BMP for weed control in peanuts & maize.	For future advancement. A survey of weed issues was conducted in December 2009.
	Nutrition	6		Determine application rates for fertiliser for maize, taking into account previous removal and plant populations.	For future advancement.
Communication & capacity building	Grower Groups	7		Redevelop the TOPCROP approach to BMP for peanuts.	For future advancement.