

SRDC Project: CSE022

**A coordinated approach to Precision Agriculture
RDE for the Australian Sugar Industry**

Communication Plan

August 2014

Project communication overview

Communication planning is undertaken in an interactive and participative manner to ensure that local knowledge, local issues and understanding of stakeholders are incorporated.

The project will adopt a participatory action research approach centred at regional case study sites (Herbert, Burdekin and Bundaberg). These activities will be supported by general communication of the project and results through dissemination of information through grower groups, reports, conference and journal papers and the media. The project will also encourage the participation of key stakeholders (including growers, researchers and sugar industry service providers) to facilitate an increased awareness and understanding which will ultimately lead to the successful adoption of Precision Agriculture (PA).

Adaptive management effectively draws together current work/understanding into a learning cycle to bridge the gap between scientists and growers. The process of adaptive management includes some diagnosis of the current situation, where we want to be and what monitoring/tools/practices are required to get there. Adaptive management effectively results in practices being refined with the end user rather than an application of a final solution.

Project objectives

The specific objectives of project CSE022 – A coordinated approach to Precision Agriculture RDE for the Australian Sugar Industry, are:

- Coordinate and integrate an evaluation of PA technologies (i.e. yield monitoring and mapping) in collaboration with leading farmers, with emphasis on economics, case studies, communication and extension led by the key farmers;
- Provide the appropriate specialist integrative and interpretive skills to complement existing research and developing PA technologies
- Provide input into investigations aimed at ‘ground-truthing’ apparent variability within specific blocks of sugarcane.
- Develop standardised data collection, management and analysis protocols.
- Improve capabilities of EOs and to provide technical support via links to appropriate specialists.

Participatory project activities

This project has two key components:

1. The coordination of RDE targeted at PA in the sugar industry including enhancing knowledge sharing among PA researchers in the industry (to ensure that growers and their advisors have a core centre of expertise on which to draw as they move forward with PA adoption); and
2. The identification and communication of the key steps in PA data acquisition and interpretation (to ensure that adoption of PA proceeds from an informed basis, following robust protocols and methodologies).

These project components will be achieved in partnership with grower groups, productivity services, local agronomists and other SRDC projects, and includes the establishment of key regional focus sites (i.e. Herbert, Burdekin and Bundaberg) to host case studies in sugar PA. Information obtained from these will be used to scope options for targeted management of cane production.

Identification of current issues, concerns, perceptions and information needs of stakeholders

The Australian sugar industry has been a rapid adopter of GPS-based technologies which promote controlled traffic farming and improved harvest management. However, there has been little adoption of PA, which involves the use of these and other technologies to acquire information about the production system at high spatial resolution, and the use of this information to target management in order to optimise production with respect to yield, crop quality and environmental goals. What little adoption has occurred has been ad hoc and poorly supported by adequate research, consultant or technical expertise.

Recent reviews of the potential for application of PA to the sugar industry (CSE018, NCA009) and an associated industry workshop concluded that PA has the potential to offer significant economic, environmental and social benefits to the Australian sugar industry and identified a need for a coordinated approach to PA RD&E. These reviews and the associated industry workshop identified a number of key priority areas for research and development for PA in the sugar industry:

1. A well-coordinated and integrated whole-of-system evaluation of PA technologies in collaboration with leading farmers, with emphasis on economics, case studies, communication and extension led by the key farmers;
2. Improved yield monitor calibrations and ground-truthing to improve the confidence in yield maps;
3. Development of standardised data collection, management and analysis protocols.

This project will provide a coordinating and communication role for PA RDE in the sugar industry. It will ensure that adoption of PA takes place from an informed basis, with common protocols in place for key issues such as yield mapping and data management. Therefore, the project provides a 'centre' of core expertise and a sound platform for industry training and extension. The ad hoc nature of the current adoption of PA arises from a lack of knowledge as to what tools are appropriate for characterising variability in cane production systems. The chief outcomes of this project will be:

- Enhanced knowledge and understanding amongst extension officers and growers of the appropriateness of various PA applications for use at particular locations or for addressing particular problems, leading to
- An increase in the number of extension officers able to provide assistance on PA to growers, and
- Enhanced adoption of PA throughout the industry.

Draft communication plan

Audience	Key Message	Tactics	Timeline	Responsibility	Progress
General sugar industry	General awareness of project activities. Specific project findings.	Industry media articles. Web sites (BSES, NCEA, CSIRO, SRDC). Conduct surveys and report on survey outputs	As opportunity arises (at least one per year).	Team member (BSES, NCEA, CSIRO) who completes activity.	Seven general industry media articles. See list at end of Table Project presence on CSIRO, NCEA and SRA web sites. Four videos have been completed with the SRA PEC team and uploaded to You Tube. See list at end of Table. Three surveys were completed through the project at regional meetings in 2008, 2010 and 2011 and one on line survey was conducted in 2014.
Sugar research community	PA research findings.	Conference papers (e.g. ASSCT, SPAA, PA Symposium).	When key results are available.	Team member (BSES, NCEA, CSIRO) who completes activity.	Six journal papers. See list at end of Table. Twelve conference papers See list at end of Table.
International research community	Sugar PA research findings, their application to other cropping systems and the application of results from other systems to sugarcane production.	Journal papers.	When key results are available.	Team member (BSES, NCEA, CSIRO) who completes activity.	Six journal papers. See list at end of Table.
Local project group	Specific project findings. Understanding of the key drivers of variability in cane blocks. The appropriateness of various PA applications.	Results and progress of case study at regional focus sites will be presented and discussed in each region. Appropriate PA applications for the local region will be	Case studies will be ongoing. - communication will be at annual local meeting and will include an update on local communications.	Bramley, Schroeder, Baillie.	Strong presence at ASSCT Cairns (four papers) and a dedicated session at ISSCT (Townsville) Regular (informal) communication between project team and local

		discussed.			collaborators, researchers and extension staff Frequent phone hook ups between whole team
Industry engaged in PA (including researchers)	Details of key PA personnel and their specific expertise. Specific project findings. Sugar PA research findings, their application to other cropping systems and the application of results from other systems to sugarcane production.	Develop a centre of PA expertise and provide these details on web sites Relevant information from the project review will be made available on the web sites. Encourage industry participants to join and participate in SPAA activities and the annual ACPA/SPAA PA symposium.	Details of PA expertise will be provided as part of web sites. Relevant project review information will be available first half of 2012.	Bramley, Schroeder, Baillie.	Key PA personnel contact details are listed on web sites. SRA 'trial tracker' to feature this project Four videos have been completed with the SRA PEC team and uploaded to You Tube. See list at end of Table.
Extension Officers	Details of key PA personnel and their specific expertise. Specific project findings. Understanding of the key drivers of variability in cane blocks. The appropriateness of various PA applications.	Develop a centre of PA expertise and provide these details on web sites, at local meetings and at annual workshop. Workshop (based around ASSCT).	Details of PA expertise will be provided at events and be an ongoing part of web sites. Workshop will be annual starting 2010.	Bramley, Schroeder, Baillie.	Key PA personnel contact details are listed on web sites. PA session at ISSCT Townsville and four papers presented at ASSCT Cairns Four videos have been completed with the SRA PEC team and uploaded to You Tube. See list at end of Table.
SRDC	Project progress. Identify gaps in knowledge and identify research needs.	Milestone reports. Final report. Project review report. Workshop (based around ASSCT).	Reports to SRDC are as per agreement. Workshop will be annual starting 2010.	Bramley, Schroeder, Baillie.	

Publication list

Journal papers:

1. Bramley RGV, Trengove, S. 2013. Precision Agriculture in Australia: present status and recent developments. *Engenharia Agricola* 33 575-588.
2. Bramley RGV, Panitz JH, Jensen TA, Baillie CP. 2013. Within block spatial variation in CCS – Another potentially important consideration in the application of Precision Agriculture to sugarcane production. *International Sugar Journal* 115 431-436.
3. Jensen TA, Baillie C, Bramley RGV, Panitz JH. 2012. An assessment of sugarcane yield monitoring concepts and techniques from commercial yield monitoring systems. *International Sugar Journal* 115 53-57.
4. Bramley, RGV. 2009. Lessons from nearly 20 years of Precision Agriculture research, development and adoption as a guide to its appropriate application. *Crop and Pasture Science* 60 (3), 197-217.
5. Bramley RGV, Jensen, TA. 2013. Sugarcane yield monitoring: a protocol for yield map interpolation and key considerations in the collection of yield data. *International Sugar Journal* 116 370-379.

Conference papers:

1. Bramley R. 2012. Mixed fortunes in crop quality sensing. Proceedings of the 15th Precision Agriculture Symposium in Australasia, held at the Grand Hotel, Mildura, 5-6 September. SPAA / University of Sydney. pp 22-26.
2. Bramley RGV. 2012. Precision Agriculture: Opportunities for Improved Management of Sugarcane Production. In: RA Gilbert (Ed) Sustainable sugarcane production. Proceedings of the ISSCT agronomy and agricultural engineering workshop, 9-14 September, Townsville.
3. Bramley RGV, Gobbett DL, Panitz JH, Webster AJ, McDonnell P. 2012. Soil sensing at high spatial resolution – broadening the options available to the sugar industry. Proceedings of the Australian Society of Sugar Cane Technologists, 34th Conference, Cairns. Electronic format. 8 pp.
4. Bramley RGV, Jensen TA. 2013. Sugarcane yield monitoring: a protocol for yield map interpolation and key considerations in the collection of yield data. Proceedings of the Australian Society of Sugar Cane Technologists, 35th Conference, Townsville. Electronic format.
5. Bramley RGV, Panitz JH, Jensen TA, Baillie CP. 2012. Within block spatial variation in CCS – Another potentially important consideration in the application of Precision Agriculture to sugarcane production. Proceedings of the Australian Society of Sugar Cane Technologists, 34th Conference, Cairns. Electronic format. 8 pp.
6. Bramley RGV, Trengove S. 2012. Precision Agriculture in Australia: present status and recent developments. In ConBap 2012 - Congresso Brasileiro de Agricultura de Precisão, Ribeirão Preto - SP, Brasil. 24 to 26 September. www.sbea.org.br/conbap2012/arquivos/R_BRAMLEY.pdf
7. Jensen T, Baillie C, Bramley R, DiBella L, Whiteing C, Davis R. 2010. Assessment of sugarcane yield monitoring technology for precision agriculture. Proceedings of the Australian Society of Sugar Cane Technologists, 32nd Conference, Bundaberg. 410-423.
8. Jensen TA, Baillie C, Bramley RGV, Panitz JH. 2012. An assessment of sugarcane yield monitoring concepts and techniques from commercial yield monitoring systems. Proceedings of the Australian Society of Sugar Cane Technologists, 34th Conference, Cairns. Electronic format. 7 pp.
9. Jensen, T.A., Fokkema, B., Baillie, C. 2011. Assessing various techniques to monitor yield in sugarcane. In: Diverse Challenges Innovative Solutions – Society for Engineering in Agriculture Conference, Gold Coast, 28-30 September, 2011. Pp248-256.
10. Jensen, T.A., Fokkema, B., Baillie, C and Bramley, R.. 2010. Assessment of sugarcane yield monitoring technology for precision agriculture – 14th Precision agriculture symposium in Australasia, Albury, 2-3 September 2010 pp 7.
11. Robson R, Abbott C, Lamb D, Bramley R. 2012. Deriving Sugarcane Yield Maps from SPOT 5 Satellite Imagery at a Regional Scale. In: RA Gilbert (Ed) Sustainable sugarcane production. Proceedings of the ISSCT agronomy and agricultural engineering workshop, 9-14 September, Townsville.
12. Robson R, Abbott C, Lamb D, Bramley R. 2012. Developing sugar cane yield prediction algorithms from satellite imagery. Proceedings of the Australian Society of Sugar Cane Technologists, 34th Conference, Cairns. Electronic format. 11 pp.

General industry media:

1. Bramley, R. 2011. Precision Agriculture: what it is and what it isn't. BSES Bulletin 31, 18-21.
2. Bramley, R. 2009. Precision farming for sugarcane production. Australian Canegrower. 9 March, 2009. 12-13.
3. Jensen, T. 2011 Bitter sweet success for sugar yield monitoring. Australian Sugarcane 15 (1), 11.
4. Jensen, T. 2010. Bitter sweet success for sugar yield monitoring. Precision Ag News 7 (1), 16-17.
5. Jensen T, Panitz J, Baillie C, Bramley R, Whiteing C, Schroeder B, Webster T. 2012. Sugarcane yield monitoring update – CSE022. BSES Bulletin 33, 9-10.
6. Schroeder, B., Panitz, J., Baillie, C., Jensen, T., Bramley, R., Whiteing, C. And Webster T. 2011. Precision Agriculture (PA) project study sites. BSES Bulletin 32, 24-27.
7. Webster, T, Panitz, J, Jensen, T. 2014. Precision agriculture survey results. SRA e-newsletter. http://www.sugarresearch.com.au/page/Your_SRA_at_work/SRA_News/26th_August_2014/Precision_agriculture_survey_results/

Videos:

1. Precision Agriculture: <http://www.youtube.com/embed/4jcKarUHkeM>
2. Yield monitors: <http://www.youtube.com/embed/mFQAY4fUdYg>
3. What is Precision Agriculture: <http://www.youtube.com/embed/sLu5t9t-67k>
4. CCS sensors in Precision Ag: <https://www.youtube.com/watch?v=5w6Uj0DGfSw>

Chronicle

Date	Revision	Author
November 2008	Draft communication plan developed and circulated for comment and feedback	Webster
December 2008	Feedback incorporated from Bramley, Baillie, Schroeder. Feedback sought from SRDC	Webster
May 2009	Feedback incorporated from SRDC	Webster
November 2010	Listed progress on communication activities	Webster
November 2012	Updated planned communication activities and progress on communication activities	Webster
November 2013		Webster
August 2014	Final update of completed activities	Webster