Technologies for improved farm productivity and competitiveness
Virtual fencing and smart tags workshop

Tuesday 8 March 2016

Summary of outcomes

This document summarises outcomes from the above workshop. The aims of the workshop were to:

- Bring stakeholders together to understand the state of play of technology development;
- Understand the opportunities that virtual fencing and related technologies offer farmers and agribusiness value chains;
- Identify issues that are important to progress development and adoption of these technologies; and
- Create a basis for collaboration to progress development and adoption of these technologies.

The workshop was attended by 65 people. A wide range of interests were represented including producers, researchers, private firms as well as government and industry representatives. Copies of the workshop presentations are available on the G21 Agribusiness Forum website: http://g21agforum.com.au/resources-and-events/events/

Workshop structure

The workshop commenced with two producer panels. The first considered technology development from a livestock perspective and the second from the perspective of integrated cropping and livestock enterprises and well as environment protection issues. Key issues arising from these discussions included:

- The huge potential for virtual fencing to facilitate improved farm productivity and thereby significantly improve profitability of farms:
    - Grazing operations typically only utilise 30-40% of available pasture;
    - Virtual fencing is a means to more effective and efficient pasture utilisation, reduced overgrazing, more strategic grazing and more effective management of crop/grazing interactions e.g. by facilitating more effective weed management and animal management within large cropping paddocks;
    - An increase in carrying capacity from more efficient grazing, which increases gross farm income per ha and consequently much larger increases in profitability per ha; and
    - Managing grazing strategically within the paddock ensures animals can always be placed on the right feed levels to support pregnancy and condition. For instance, with regard to sheep this nurtures bonding between ewe and lamb, improving lamb survival and growth.
- The need to integrate new technologies to make user interfaces more accessible:

  - There is a raft of new technologies that are beginning to be applied on farms. Virtual fencing technologies need to work in conjunction with these and vice versa to make them readily accessible by the wide variety of farmers and farming systems.
- Potential for improved environmental management including protection of:
  - Soils vulnerable to exposure by grazing and subsequent wind or water erosion;
  - Riparian zones;
  - Remnant and regenerating bush land areas;
  - Vulnerable and sensitive land areas e.g.in alpine areas, bushfire recovery areas; and
  - Reduced greenhouse emissions.

Following the panels there were a number of presentations covering animal welfare considerations, technology developments and associated issues and opportunities for ongoing development. Key issues raised in these discussions included:

- The results of CSIRO research into the effects of virtual fencing including illustration of associative learning by animals, comparative effects compared to common animal handling techniques, how risk factors are being addressed and implications for stakeholders;
  - Characteristics of the technology being developed in Australia include the use of sound prior to electric shock, the delivery of stimulus in response to animal movement not position, and the ability to shepherd animals back to areas if they go through the virtual fence;
  - CSIRO researchers concluded that the response of cattle to audio and electrical signals bring about the same low-level reaction in an animal as conventional livestock handling equipment;
- Regulation currently largely prohibits the use of virtual fencing in Victoria and it is regarded as a highly controversial issue by some animal welfare organisations. It was suggested that changing this situation would likely require the technology to demonstrate positive animal welfare benefits;
- Technology developments mean that virtual fencing and associated shepherding of animals is within reach for commercial application;
- Technologies for handling cattle are more advanced than for sheep, for which there is a considerable need for additional research;
- There is a need for more applied research to investigate how best to utilise the technology in different farming systems;
- The eShepherd concept being commercialised by Agersens has a range of applications and is soon to commence trials in NSW, with the product currently planned for commercial release in 2017;
- Linking virtual fencing to tracking and traceability technologies offers great scope to enhance marketability of agricultural outputs and there are market opportunities in producing meat for high value markets (both domestic and export); and
- There is potential for convergence of technologies that could see virtual fencing technology incorporated into ear tags or similar devices.

Conclusions

Following the presentations there was general discussion of the issues arising from the presentations and discussions throughout the day. Key issues identified included:

- To maximise adoption, virtual fencing technologies need to be **affordable, easy and integrated:**
    - There needs to be a clear value proposition, which may vary depending on the needs of various farming systems.
- Technology development needs **breadth of application:**
    - It needs to meet the information needs of farmers, be cost effective and deliver industry-wide (value chain) benefits; and
    - Virtual fencing is much more than a "fence". It is a management tool that facilitates improved animal and land management to increase productivity as well as environmental protection and enhanced animal welfare.
- **Regulation** for animal welfare currently limits the development of virtual fencing technologies:
    - These concerns need to be addressed in an inclusive manner based on independent research and by engaging all relevant stakeholders;
    - Independent research needs to be accessed to ensure alignment between stakeholder perceptions and scientific evidence; and
    - Politicians at all levels need to be informed of the limitations imposed by current regulations and a review of ethical codes should be undertaken.
- **Research** priorities include:
    - Applications for sheep;
    - Measured welfare benefits for animals; and
    - Development of practical on-farm applications.
- **Collaboration** is required at a national level and across value chains to progress development of these technologies.

Actions

Following discussion of key issues, three groups were formed to identify actions to progress development and adoption of virtual fencing technologies. The key matters raised under each issue were:

- **Research and technology development:**
    - Support for a successful outcome for the current application to the Rural R&D for Profit program. If this program is not successful, approach individual R&D Corporations to support development. As part of this encourage GRDC to become actively involved – reflecting the potential benefits for mixed copping and livestock farms;
    - Support the attraction of funding to include virtual fencing in the Australian Spatial Livestock Innovation Program (ASLIP);
    - On-farm commercial application trials are a priority for further investment;
    - Need to consider intellectual property arrangements; and

- Potential areas for future technology research include linking virtual fencing with smart ear tag development, battery/power supply issues and re-usability of devices.

- **Regulation and animal welfare**
  - Need to engage a range of stakeholders including landholders, State governments, Commonwealth government, parliamentarians, farmer representatives, producer groups, animal welfare groups (and specifically the RSPCA), researchers, processors, catchment management authorities and the general public;
  - Support for a forthcoming meeting with the Minister for Agriculture in Victoria outlining the key issues identified as part of this workshop, including supportive emails from relevant interest groups;
  - Need to ensure that the technology is seen as being more than just a virtual fence. This is illustrated in the eShepherd technology being developed by Agersens; and
  - Recognise that the technology is an animal, herd and land management tool capable of delivering significant productivity and animal welfare improvements.
- **Adoption**
  - On-farm application trials and business use studies are a vital to developing technology that is capable of delivering significant improvements in productivity, profitability and competitiveness for farmers. As part of this need to identify and work with wiling participants (as part of the conference a number of farming enterprises indicated a willingness to be part of on-farm trials);
  - There needs to be effort to present the technology as much more than a virtual fence, reflecting its application as a shepherding tool to improve herd management as well as land and business management;
  - Building farmer understanding through education and relevant publicity; and
  - A need to develop the support of a wide range of stakeholders (as noted above).

Next steps

On the basis of the above conclusions it was agreed that:

- The G21 Agribusiness Forum act to develop a cohort of stakeholder organisations that can develop a national approach to the development of virtual fencing. In particular, the National Farmers Federation should be approached to take up advocacy on this issue;
- The outcomes of the workshop should be communicated to the Victorian Minister for Agriculture in association with the forthcoming meeting between CMAs and Agersens – to ensure that the Minister understands the significant benefits that virtual fencing could deliver in terms of economic advancement of agriculture particularly in Victoria. Outcomes should also be communicated to other State Ministers and the Commonwealth Minister for Agriculture; and
- There is a need to review the impact of legislation for the protection of cruelty to animals in light of outcomes from CSIRO research and to ensure that current impediments to the development of technologies are addressed.

A steering group consisting of volunteers from workshop attendees will oversee activities by the G21 Agribusiness Forum with the aim of generating national action as outlined above.