

Commercialising an automated GPS-based virtual fencing system for livestock*Dana Campbell¹, Jim Lea¹, William Farrer², Sally Haynes² and Caroline Lee¹**¹CSIRO, Agriculture and Food, Australia, ²Agersens, Australia; dana.campbell@csiro.au*

Managing grazing cattle, particularly in extensive pasture-based systems is challenging due to the limited farmer contact with animals and this may result in welfare issues. Vast farm areas can restrict construction of physical fences that enable better control over animal monitoring. Thus virtual fences (VF) – boundaries with no physical barrier – have the potential to enable remote monitoring of animal location and movement patterns, reduce handling during herding and keep animals away from hazardous environments. Consequently, VF represent a sustainable fencing solution in complex land areas for improved welfare. The Commonwealth Scientific and Industrial Research Organisation (CSIRO) has partnered with Agersens, Australia to commercialise patented VF collar technology for cattle. The VF algorithm tracks the animals' location through GPS and emits an audio tone as the animal approaches the VF boundary. If the animal stops or turns away no electrical stimulus is applied, but if the animal continues forward an aversive electrical stimulus is applied. Animal location and collar activity can be monitored online. The automated collar prototypes were tested on a group of 6 Angus heifers located in a 6.2 ha experimental paddock. Cattle were first given access to 100% of the paddock for 4 days to acclimate and then a VF was set to restrict animals to 40% of the paddock. Excluding the first 24 h period of learning the VF boundary, across approximately 1 week, on average, animals spent 90.52% (SE 2.30%) of their time in the 40% inclusion zone. On average, 79.72% (SE 1.20%) of the signals emitted by the collar were audio cues, indicating animals were avoiding the VF based on audio signals alone. These initial tests show the automated collars represent a potential tool for remote control and monitoring of grazing cattle for improved welfare management. This project is supported by funding from the Australian Government Department of Agriculture and Water Resources as part of its Rural R&D for Profit programme.