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## **Improving landholders' knowledge of fire as a management tool within the Burdekin rangelands**

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### **Abstract**

There has been a reduced use of fire as a management tool in grazing systems within the Burdekin rangelands since the wet years of the 1970's. Several severe droughts and the adverse effects of wildfire have resulted in a negative perception of the role of fire as a management tool. The reduced frequency of fire has contributed to a decline in some 3P grasses, an increase in woody weeds and a change in woodland structure. As a result land condition has deteriorated causing a reduction in carrying capacity for beef production. In November and December of 2011 QDAFF ran five fire management information days on host properties within the Burdekin catchment to outline the role of fire and its importance in land management. In total, the information days were attended by 56 beef producers representing 54 properties covering an area of 1,728,738 ha, two national parks employees and two employees from local mines. Four members from Queensland Fire and Rescue also attended to provide information on fire safety and regulatory aspects. Producer feedback indicated 51% of attendees felt they could make more use of fire to improve their pasture management, with 92.9% feeling more informed to make decisions about the use of fire as a result of participating in the day.

The fire management information days are part of a larger extension program to improve the management of beef enterprises in the Burdekin catchment.

### **Introduction**

Australian rangelands evolved under a regime of relatively frequent fire. Fire was widely used by indigenous Australians for hunting, to open country and promote grass regrowth, thereby maintaining ecological balance (Wyrwoll *et al*, 2012). Following the introduction of livestock to the Burdekin catchment, fire was used to remove moribund grass, managing the tree grass balance, reducing the density of undesired woody weeds, such as Chinese apple (*Ziziphus mauritiana*) and favouring the more productive fire tolerant native pastures, like black speargrass (*Heteropogon contortus*) (Dyer *et al*, 2001). Since the 1970's, several severe droughts and the adverse effects of occasional wildfire have resulted in a negative perception by graziers of the role of fire as a management tool (Greiner *et al*, 2008). The reduced frequency of fire in grazing systems has contributed to a decline in some 3P grasses, an increase in woody weeds and a change in woodland structure (Dyer *et al*, 2001). As a result land condition has deteriorated causing a reduction in carrying capacity for beef production (Landsberg *et al*, 1998).

### **The negative perception of fire**

Over the past 30 years the Burdekin catchment has experienced periods of severe drought, but has also had record wet seasons (O'Reagain *et al*, 2009). The big wet seasons have led to large quantities of feed being produced and haying off before being able to be grazed. In these years large amounts of dry matter have carried over into the dry season, creating large fuel loads for hot, intense fast moving wildfires (Dyer *et al*, 2001). Such wildfires can potentially destroy grazing, infrastructure, machinery and buildings and are also a major safety threat. The shift towards a negative perception of fire as a grazing land management tool has resulted

from a generation of graziers with an increasing experience of damaging wildfires and poor post-fire outcomes (Greiner *et al*, 2008). These include not receiving follow up rain resulting in a shortage of feed and pasture degradation resulting from heavy stocking rates or not spelling post fire. Fire can also be seen as an economic cost to graziers. The option to use urea licks now also allows graziers to utilize low quality forage that was once incapable of supporting livestock during the dry season.

The reduced use of fire has led to the loss of pre-fire planning, fire control and post-fire management skills. Without such skills even fires lit under ideal climate conditions can still result in a loss of desirable pasture species like black speargrass and pitted bluegrass (*Bothriochloa decipiens var. decipiens*), an increase in sapling recruitment and a decline in land condition (Williams *et al*, 2003).

The reduced use of fire in land management has led to a deterioration of land condition within the Burdekin. An increase in woody weeds and woodland thickening has reduced pasture production through competition, reducing the carrying capacity and directly reducing land condition (Landsberg *et al*, 1998). This increases the grazing pressure on the remaining pasture, further increasing the potential for degradation.

### **Fire management information days**

As part of a larger extension program to improve the management of beef enterprises in the Burdekin catchment, in late 2011, QDAFF staff ran 5 fire management information days on host properties across various locations in the catchment. These days aimed to inform graziers of the potential environmental, economic and production benefits of fire when used appropriately within a grazing system. Prior to the days, the fire history and management on each of the host properties was collated into a case study.

The information presented aimed to increase awareness on how fire can be used successfully to improve land condition by managing the density of native woody plants, like currant bush (*Carissa ovata*) (Landsberg *et al*, 1998), control exotic woody weeds, such as rubber vine (*Cryptostegia grandiflora*) (Bebawi *et al*, 2000) and manipulate woodland structure (Williams *et al*, 2003). The potential use of fire to influence pasture composition, improve evenness of grazing within a paddock, reduce hazards or wildfire risk and control ticks or other parasites (Dyer *et al*, 2001) were also addressed. Economic data was also presented showing that fire can be a less expensive option compared to not burning or mechanical, to improve land condition and carrying capacity. These showed that greater economic results from fire occurred on poorer quality land types.

The Queensland Fire and Rescue service also attended the information days to provide information on fire safety and regulatory aspects. Their support of local brigades is essential to support a burning program. Those planning to use fire were also encouraged to set up photo monitoring sites to monitor and record the effectiveness of the fire.

Producer feedback indicated 51% of attendees felt they could make more use of fire to improve their pasture management in the future, 84.5% learnt which exotic woody weeds are susceptible to fire and 63% planned to use fire to control exotic woody weeds. Further, 72.2% intended to use fire to reduce woodland thickening and 70.7% learnt the fire frequency required to suppress woodland thickening. Overall 92.9% of participants felt more informed to make decisions about the use of fire as a result of participating in the day.

Another important and invaluable aspect to the fire management information days for QDAFF staff included the experience in the use of fire in different landtypes that the graziers' brought to the discussions.

In March 2012, 4 months later, a participant at the fire management information days contacted QDAFF staff at Charters Towers and spoke of fire management decisions they had implemented as a result of the day. While the participant was previously fire adverse and had never used it as a management tool, based on the day a large paddock that had been destocked for 12 months was burnt and wet season spelled. A large body of moribund feed was removed and while there was some concern about follow up rain, when it did rain there was an excellent pasture response. The participant was happy with this decision to burn with a significant difference in feed quality between the burnt and unburnt paddocks. Despite ongoing concerns about the risks associated with using fire, especially relating to a potential failure of follow up rains, the participant intends to incorporate a fire regime into the current management of the property, when and where suitable in order to increase pasture production. This case study shows a clear management change with the newly acquired knowledge from the fire management information days, enhancing the decision making process of the grazier.

Further QDAFF extension efforts aimed at improving land condition in the Burdekin catchment that include the use of fire, include grazing land management (GLM) EDGE workshops, StockTake workshops and producer demonstration sites (PDS). As an example, a currant bush PDS will be initiated in the upper Burdekin to look at fire as one option for its control. There may also be an opportunity to follow up on the fire management information days to reinforce the message that fire is an important part of maintaining rangelands in good condition when appropriately applied with correct grazing management.

In conclusion the fire management information days were successful in exposing land managers to the benefits of appropriate fire use and there has been increased acceptance of its value as a management tool. As a result of the days we have seen the implementation of fire regimes, these will hopefully increase land condition in the future by reducing the extent of woody thickening on grazing lands.

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