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Capturing and quantifying the impacts of grasshoppers and locusts across central and north-west Queensland

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Over the past four years, grasshopper and locust species have been increasingly causing impacts to pastures across central and north-west Queensland. This has caused substantial damage to pastures, prevented pasture recovery on a number of properties and contributed to significant economic consequences. A *Grasshopper Impact Survey* was initiated in 2020 and re-done in 2021 with the objective of capturing comparative data and key impacts across the affected regions, with 56 and 59 business participating, respectively. Issues focussed on in the survey included grasshopper distribution and numbers, resultant pasture damage, management responses and estimated economic impact. When grasshopper populations started emerging in 2018 producers were unprepared in terms of planning or budgeting for the impacts. However, this earlier experience allowed producers to be adaptive in their management practices during the population boom in 2021. These practices still came at a cost to producers.

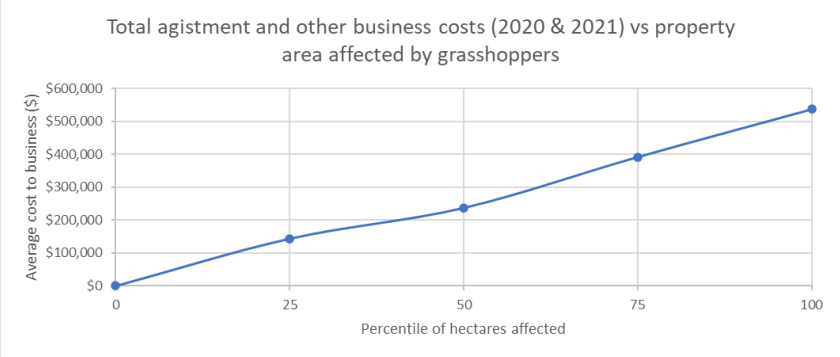

Fig. 1. Business costs in comparison to the area of property affected by grasshoppers.

Fig. 1 represents the average cost to business in relation to the area impacted on properties. The graph shows a strong positive relationship, with the cost to the businesses increasing with increasing amount of area affected. Based on the best available information provided through the 2021 producer survey, the total costs recognised by the 59 participating businesses is estimated at $18 343 500 for the 2020 and 2021 seasons. Therefore, the total cost per hectare, based on the responses provided within the survey, was estimated at $14.02/ha over the two years. This figure is comprised of increased costs including agistment, transport, supplementary feeding, time, labour, and spraying. In addition, there were significant foregone opportunities through early weaning, delayed restocking and an inability to retain stock numbers which, in turn, meant reduced wool clips and live weight turnoff. Adaptations included implementation of practices such as earlier weaning and culling; planned sales or earlier sourcing of agistment; delaying the purchase of stock in response to rain; forage budgeting and implementation of possible grasshopper control methods.

The Grasshopper Working Group instigated Emergency Use Permit's for the two chemicals Fenitrothion and Fipronil to allow an option for producers to spray grasshoppers on pastures in the Mitchell grass bioregion. An option for producers to use on organic-certified properties was Green Guard®, a bio-insecticide containing a naturally occurring Australian fungus, *Metarhizium anisopliae* var. *acridum*, mixed with a spray oil.

Grasshopper numbers began to decline in March/April 2021 with the onset of colder weather and the assumed increase in predator populations. Colder weather as explained in Rentz *et al.* (2003), causes species to go into a diapause state, meaning their development becomes suspended. In conclusion, from the data provided it can be observed that there has been significant impact from grasshoppers in the past four years, 2018-2021. Research into the ecology and life cycle of species and population prediction modelling is advocated to guide towards preparing producers for possible population increased for implementation of more timely management practices.

References

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