To the Senate Rural and Regional Affairs and Transport References Committee, concerning the **Inquiry into Red Imported Fire Ants in Australia**.

Inquiry Terms of Reference:

(a) The expected costs and impacts, if red imported fire ants are able to spread across Australia, on human health, social amenity, agriculture, the environment, infrastructure and regional workers;
(b) an assessment of the current and any proposed fire ant response plans for achieving the eradication of red imported fire ants;
(c) an evaluation of funding provided for the current or any proposed fire ant response plans;
(d) the effectiveness of eradication efforts and the spread of fire ants;
(e) learnings of Varroa mite in managing red imported fire ants; and
(f) any other related matters.

CEBRA: Background and conflict of interest declaration

1 The Centre of Excellence for Biosecurity Risk Analysis (CEBRA), an initiative of the Australian government, is a research group supported the Australian Department of Agriculture, Fisheries and Forestry (DAFF), the New Zealand Ministry for Primary Industries (MPI), and by the University of Melbourne (the university), at which it is based.

2 CEBRA supports DAFF and MPI in protecting Australia and New Zealand's agriculture, natural environments, and human health from biosecurity threats. CEBRA delivers practical solutions and advice related to the assessment, management, perception, and communication of biosecurity risk. CEBRA's work informs the implementation of risk-based approaches to biosecurity regulation across the continuum of pre-border, border, and post-border activities.

3 CEBRA enjoys a unique relationship with DAFF and MPI, occupying a research / policy nexus that provides access to and leverage upon the key challenges faced by science-based regulators. The funding model provides a stable platform for long-term identification, translation, and resolution of these challenges and enables a better understanding of and therefore support for authentic and relevant innovation.

Centre of Excellence for Biosecurity Risk Analysis
Schoo of B oSc ences
The Un vers ty of Me bourne
V ctor a 3010 Austra a
T: +61 3 8344 4405
W: www.cebra.unimelb.edu.au

4 Consequently, CEBRA declares a **conflict of interest** in its commentary on aspects of the Australian biosecurity system because of the nature of its financial support and its operating model. CEBRA works very closely with DAFF, which is a key actor in the biosecurity system, and a large proportion of CEBRA research is funded by DAFF or biosecurity regulators in the states and territories.

A. The expected costs and impacts, if red imported fire ants are able to spread across Australia, on human health, social amenity, agriculture, the environment, infrastructure and regional workers

5 Using a large dimensional spatial-spread simulation model (the CEBRA 'Value of biosecurity' model) with both market and environmental land use categories for eastern Australia, work by CEBRA (under review, not publicly available) shows that total economic damages from RIFA (i.e., including both market and non-market values) over a 30-year period range from **$30 billion to $191 billion**, depending on the frequency of outbreaks and the land-use categories that are impacted.

D. The effectiveness of eradication efforts and the spread of fire ants

6 RIFA are notoriously difficult to eradicate in general, although of late considerable progress has been made.[1]

7 At least six genetically distinct RIFA incursions have been eradicated in Australia[2], including: colonies in the Port of Gladstone, Port of Sydney, Brisbane airport, and the Port of Brisbane. These distinct RIFA incursions have ranged in size from single colonies to multiple hundreds of colonies.

8 The eradication programme for the ongoing Richlands/South-East Queensland incursion has very likely significantly delayed the spread of RIFA, which has benefits that can be estimated but we are unaware of any relevant studies that do so.

9 Australia's ability to manage RIFA incursions has benefited from past learnings of the eradication programme, particularly related to the use of passive surveillance in urban areas and remote surveillance by air in rural areas.[3] Furthermore, programme staff are continually gaining insights about RIFA management, including scientific, operational,

[1] Liu, H.K., et al. Eradication and Control Strategies for Red Imported Fire Ants (*Solenopsis invicta*) in Taiwan. *Sustainability* 12, 3951 (2020); doi:10.3390/su12103951
[2] https://www.fireants.org.au/stop-the-spread/how-fire-ants-arrived-in-australia#incursions
[3] Spring, D., Cacho, O.J. Estimating eradication probabilities and trade-offs for decision analysis in invasive species eradication programs. *Biol Invasions* 17, 191–204 (2015). https://doi.org/10.1007/s10530-014-0719-9

community, industry and political issues, and changes needed for successful eradication.[4]

10 Investment in community engagement in RIFA management has served to highlight the usefulness of community surveillance for detecting incursions. Community engagement enables passive surveillance, that is, ad-hoc surveillance undertaken by members of the public. Concerning RIFA, it has been estimated that $1m invested in public engagement activities had resulted in $60m saved in active surveillance costs between 2006 and 2010.[5,6]

E. Learnings of Varroa mite in managing red imported fire ants

11 It is extremely difficult, but essential, to understand the full extent of incursions (*delimit* the incursions) before starting and during an eradication programme. In the case of RIFA and varroa, we consider that lack of sufficient delimitation has been a key factor in failure to eradicate quickly. RIFA infestations that were accurately delimited in the early years of the eradication programme have been successfully eradicated.[7,8]

12 In the case of the response to varroa, we speculate that hive movement restrictions were not adequately calibrated to likely stakeholder responses — the well-intentioned quarantine movement restrictions encouraged illegal movement of hives, rather than encouraging the behaviour sought by NSW DPI.

Thank you for the opportunity to comment on the terms of reference for this inquiry.

Yours truly,

Professor Andrew Robinson,
on behalf of the Centre of Excellence for Biosecurity Risk Analysis.

---

[4] Scott-Orr, H., Gruber, M. and Zacharin, W. (2021) *National Red Imported Fire Ant Eradication Program Strategic Review*. Report for the Steering Committee. https://www.agriculture.gov.au/sites/default/files/documents/Strategic%20Review%20of%20the%20National%20Red%20Imported%20Fire%20Ant%20Eradication%20Program%20August%202021.pdf

[5] Cacho, O., Reeve, I., Tramell, J., Hester, S. 2012. Valuing community engagement in biosecurity surveillance. Final Report for ACERA 1004B ID7, Australian Centre of Excellence for Risk Analysis, University of Melbourne, 90pp. Available from https://cebra.unimelb.edu.au/__data/assets/pdf_file/0005/2068736/1004B_OID7_Report.pdf

[6] Hester, S.M., Cacho, O.J. The contribution of passive surveillance to invasive species management. *Biol Invasions* 19, 737–748 (2017). https://doi.org/10.1007/s10530-016-1362-4

[7] Wylie, R., Jennings, C., McNaught, M. K., Oakey, J. & Harris, E. J. (2016). Eradication of two incursions of the Red Imported Fire Ant in Queensland, Australia. *Ecological Management & Restoration* 17, 22–32

[8] Keith, J.M., Spring, D. & Kompas, T. Delimiting a species' geographic range using posterior sampling and computational geometry. *Sci Rep* 9, 8938 (2019). https://doi.org/10.1038/s41598-019-45318-5