



QUEENSLAND FARMERS' FEDERATION

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Submission

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Department of Agriculture, Water and the Environment
GPO Box 858
CANBERRA ACT 2601

Via email: waterquality@agriculture.gov.au

To Whom It May Concern

Re: Draft default guideline values for the Water Quality Guidelines (August 2021)

The Queensland Farmers' Federation (QFF) is the united voice of intensive and irrigated agriculture in Queensland. It is a federation that represents the interests of 20 peak state and national agriculture industry organisations and engages in a broad range of economic, social, environmental and regional issues of strategic importance to the productivity, sustainability and growth of the agricultural sector. QFF's mission is to secure a strong and sustainable future for Queensland farmers by representing the common interests of our member organisations:

- CANEGROWERS
- Cotton Australia
- Growcom
- Nursery & Garden Industry Queensland (NGIQ)
- Queensland Dairyfarmers' Organisation (QDO)
- Australian Cane Farmers Association (ACFA)
- Queensland United Egg Producers (QUEP)
- Turf Queensland
- Queensland Chicken Meat Council (QCMC)
- Bundaberg Regional Irrigators Group (BRIG)
- Burdekin River Irrigation Area Irrigators Ltd (BRIA)
- Central Downs Irrigators Ltd (CDIL)
- Fairbairn Irrigation Network Ltd
- Mallowa Irrigation Ltd
- Pioneer Valley Water Cooperative Ltd (PV Water)
- Theodore Water Pty Ltd
- Eton Irrigation Scheme Ltd
- Pork Queensland Inc
- Tropical Carbon Farming Innovation Hub
- Lockyer Water Users Forum (LWUF).

The united voice of intensive and irrigated agriculture



QFF welcomes the opportunity to provide comment on the draft default guideline values for the Water Quality Guidelines. We provide this submission without prejudice to any additional submission from our members or individual farmers.

Background and toxicants under review

The stage 2 draft toxicant guidelines were released this year, as a joint initiative between the Australian and New Zealand governments and the Australian state and territory government. The guidelines are derived for a range of physio-chemical and habitat indicators which are based on the latest science methodologies. These guidelines are developed to help protect aquatic ecosystems and human water uses, such as recreation, irrigation and stock watering.

The current toxicants that are under review for the Australian and New Zealand Guidelines, for fresh and marine water quality are:

- Alpha-cypermethrin in freshwater
- Bisphenol A in freshwater
- Bisphenol A in marine water
- Dioxins in freshwater
- Fipronil in freshwater
- Mancozeb in freshwater

QFF represents intensive and irrigated agriculture in Queensland and, as such, the toxicants that are under review that could potentially impact the agricultural sector are:

- Alpha-cypermethrin in freshwater
- Dioxins in freshwater
- Fipronil in freshwater, and
- Mancozeb in freshwater.

Bisphenol A does not have a direct impact on the agricultural sector; however, the default value guidelines (DGV's) have undergone extensive scientific research due to the volumes used in manufacturing of polycarbonate plastic, and are noted to have moderate reliability DGV's. The toxicants noted to impact agriculture are found in a variety of farm applications that include, insecticides, herbicides, and fungicides.

It is important to note that in Queensland, water quality is underpinned by an existing regulatory framework via the *Environmental Protection Act 1994* (EP Act), and subordinate regulation including but not limited to the *Environmental Protection (Water and Wetland Biodiversity) Policy 2019* (EPP Water and Wetland Biodiversity). The EPP Water and Wetland Biodiversity upholds the object of the EP Act in relation to waters and wetlands; and the implementation of the Reef 2050 Water Quality Improvement Plan to help address water quality targets and improve reef water quality.

Summary

The use of pesticides and insecticides in agricultural production in Australia has seen dramatic changes over the past thirty years with decreased use and increased transparency and reporting. This has been accompanied by an increasing number of agricultural producers implementing best management practices (BMP's) to reduce their impact on the environment through the implementation of varying management practices that address on farm efficiency, and reduce their environmental footprint.¹ These BMP's are consistently changing, through technological and scientific advancements, more efficient use of water and changes to farming systems. The use of toxicants on farm have seen vast shifts during the past thirty years, as both farm applications and changes to climate, have altered

¹ Final Report of the Independent Review of the Pesticides and Veterinary Medicines Regulatory System in Australia Ken Matthews AO (Chair), Dr. Anne Astin AM PSM, Dr. Mary Corbett, and Dr. Craig Suann; Department of Agriculture, Water and the Environment, 2021.

farming systems. While the default guideline values (DGV), provide an avenue to align best management practices, it is also to be noted that actual risks associated with toxicity can be difficult to quantify (Navarro *et al.*, 2021).² This is because metrics such as pesticide use (kg/ha) or spray frequencies are commonly reported in aggregated form and are not linearly related to toxicity hazard and therefore a less informative in driving reductions in impact. A toxicity hazard or similar would provide a more suitable indicator.

Pathway for toxicant default guideline values.

Setting a regulatory framework for toxicants in Australia, is appreciated to be one of a complex nature, with many variables impacting the end value toxicity data sets, including the quality of groundwater and brackish and hypersaline surface water, sediment suspension values, biological indicators and climate.

QFF supports the amendments to the default value guidelines and supports the DGV's used as guidelines for fresh and marine water quality but does not support this data setting the foundations for a regulatory framework. This is due to the varying results from the ecotoxicological data sets in each toxicant under review, and insufficient toxicity equivalent factors that do not give an absolute value as outlined in the technical brief for Dioxins in freshwater.³

Environmental values utilised in the assessments for all the above listed toxicants are derived from modality assessments.⁴ These modality assessments help determine the different sensitivities amongst diverse organisms to a chemical, which then helps to determine what statistical variants are more representative of the whole data set to inform a general guideline when there is no specific guideline value applied to the chemical. Water quality guidelines are also recognised as a trigger to assess whether the water is fit for human consumption and help provide an integrated approach to the management of water quality from land use impacts. Impacts to soils and waterways, resulting from pesticides can vary, and it is vital to acknowledge that each toxicant has different degradation half-lives that are impacted by their ability to adsorb to sediments, become mobile through the soil, become soluble in water, or reduce the toxicity and half-life through changes in climate.

Fungicides such as Mancozeb (from the dithiocarbamate group), is a common ingredient in broad spectrum fungicides that help prevent crop damage in the field and protect crops from deteriorating whilst in storage and in transport, and one that is utilised in horticultural production. The DGV proposed for mancozeb is based on chronic toxicity values for a variety of species from four different taxonomic groups, however, due to the way the compound degrades in the environment through its mobility to adsorb to soil and sediment and high water solubility, changes the available uptake of certain species due to increased bioaccumulation. The analysis for the DGV was therefore formulated at 95%, due the high mobility rate and increased environmental toxicity, however, there is still uncertainty on defining what exact impacts this could cause best management practices on farm, including safety standards.

QFF supports the current DGV proposed for mancozeb due to the environmental impacts that it could cause to different agricultural commodity groups but cannot support changes to the proposed DGV without meaningful consultation with a wider segment of stakeholders from the food, fibre and foliage sectors. It should also be recognised that there are inconsistencies in the final assessments of the different toxicants outlined in this review, including fipronil, and mancozeb which listed varying ecotoxicological effects on limited taxonomic groups, but larger species subsets. There are also no allowances made for the proposed changes in climate that will cause

² Pesticide Toxicity Hazard of Agriculture: Regional and Commodity Hotspots in Australia; Javier Navarro, Michalis Hadjikakou, Bradley Ridoutt, Hazel Parry, and Brett A. Bryan; *Environmental Science & Technology* **2021** 55 (2), 1290-1300.

³ Toxicant default guideline values for aquatic ecosystem protection – Dioxins in freshwater, Technical brief; Australian and New Zealand Guidelines for fresh and marine water quality. 2021.

⁴ Revised method for deriving Australian and New Zealand water quality guideline values for toxicants Prepared for the revision of the Australian and New Zealand guidelines for fresh and marine water quality Report. 2018.

variations to the concentration of toxicants identified in various water bodies and bioaccumulation levels in species, or increased dissipation rates of some toxicants from elevated temperatures.

While the current methodology utilised to form the basis for the DGV's is not currently regulated, varying factors used in the calculations could potentially increase the probability that these DGV's are not at the highest accuracy level, especially for toxicants such as those from the dithiocarbamate group that do become highly mobile within and environment, but have limited conclusive studies to confirm the concentration in aquatic environments, due to the mobility within soils, and difficulties to extract or analyse as a singular toxicant.⁵

Using a variety of modality assessments for the adoption in the assessment of slightly to moderate disturbed ecosystems, has the potential to form inaccuracies in the final DGV's.⁶ It is recommended that any inconsistencies in the data sets are only used in accordance with the Australian and New Zealand Guidelines for Fresh and Marine Water Quality, and not to set the basis for a regulatory framework, and only intended for the application for water quality guidelines for slightly-to-moderately disturbed ecosystems as outlined in the toxicant default guideline technical briefs.

Proposal for future default value guidelines

Currently there is no immediate pathway that provides the agricultural sector with a comprehensive toxicant list to provide reference to the changes to toxicant values and what impacts these changes could impose to chemical application rates and residue levels on farm. A cohesive and informed reporting framework is needed in Australia to provide a comprehensive list of all ANZG toxicants, and what these changes will mean to on farm use of pesticides, herbicides and fungicides.

The ability for farmers to obtain clear and concise data on toxicant guidelines is paramount, to ensure the continued efficiency of production of food, fibre and foliage and BMP's, whilst also maintaining the level of water quality that is not only fit for human consumption, but also livestock and irrigation to ensure the continued provision of world class agricultural products for domestic and export markets.

The development of a single national point of reference, that includes an environmental monitoring platform, and performance measures to help farms identify water quality issues will help assist the agricultural sector to balance chemical application and environmental protection that will help support sustainable agriculture into the future.

Yours sincerely

Dr Georgina Davis
Chief Executive Officer

⁵ Toxicant default guideline values for aquatic ecosystem protection – Mancozeb in freshwater, Technical brief; Australian and New Zealand Guidelines for fresh and marine water quality. 2021

⁶ Toxicant default guideline values for aquatic ecosystem protection – Fipronil in freshwater, Technical brief. Australian and New Zealand Guidelines for fresh and marine water quality. 2021.