22-101A Analysis for IDAPA 02.03.03 Rules Governing Pesticide and Chemigation Use and Application

Idaho Code Section 22-101A Statement: Section 22-101A(1), Idaho Code provides that the Idaho State Department of Agriculture ("ISDA") must clearly specify that the proposed rule, or portions of the proposed rule, are broader in scope or more stringent than federal law or regulations, or regulate an activity not regulated by the federal government. This information can be found in the Notice of Proposed Rulemaking for the Rules Governing Pesticide and Chemigation Use and Application ("Pesticide Rule").

Section 22-101A (2) (a), Idaho Code. To the degree that a department action is based on science the department shall utilize the best available peer reviewed science and supporting studies conducted in accordance with sound objective scientific practices.

The ISDA has been delegated primary authority to enforce certain aspects of The Federal Insecticide, Fungicide, and Rodenticide Act ("FIFRA") in Idaho. This is the federal statute that governs the registration, distribution, sale, and use of pesticides in the United States. A pesticide is "(a) any substance or mixture of substances intended to prevent, destroy, control, repel or mitigate any insect, rodent, nematode, snail, slug, fungus, weed and any other form of plant or animal life or virus, except virus or fungus on or in living man or other animal, which is normally considered to be a pest or which the director may declare to be a pest, and (b) any substance or mixture of substances intended to be used as a plant regulator, defoliant or desiccant, and (c) any spray adjuvant." Idaho Code § 22-3401(23). The ISDA works cooperatively with the United States Environmental Protection Agency ("EPA") under FIFRA, the Idaho Pesticides and Chemigation Act, and the Pesticide Rules.

The requirements set forth in the Pesticide Rule that are designed to protect human health and the environment are based upon the best available peer reviewed science and supporting studies. In promulgating and reviewing the various sections of the Pesticide Rule, the ISDA relied on the Human Health Risk Assessment for Pesticides and the Ecological Risk Assessment for Pesticides performed by the EPA. These rigorous analyses are performed by the EPA for all new pesticides entering the market place and periodically re-evaluated to ensure that pesticide products continue to meet the appropriate safety standards. Pesticides are evaluated by the EPA to determine that the pesticide will not pose any unreasonable risks to plants, wildlife, and the environment. Additionally, a human health risk assessment estimates the nature and probability of adverse health effects in people who may be exposed to pesticides as a result of activities that may lead to contact with pesticide residues. The human health analysis includes a hazard identification, dose response assessment, exposure assessment, and risk characterization. *See* https://www.epa.gov/pesticide-registration/understanding-science-behind-epas-pesticide-decisions. Specific label restrictions that are based on both the Human Health Risk Assessment and the Ecological Risk Assessment cannot be eased through the ISDA rulemaking. All rule sections contained within the Pesticide Rules are in addition to an individual pesticide label.

Section 22-101A (2) (b), Idaho Code. To the degree that a department action is based on science the department shall utilize data collected by accepted methods or best available methods if the reliability of the method and the nature of the decision justifies use of the data.

The EPA risk assessment procedures are derived on "foundational principals that promote a culture of scientific integrity, public involvement, the use of peer review and Federal Advisory Committees, and the development of [EPA] scientists." *See* https://www.epa.gov/pesticide-registration/understanding-science-behind-epas-pesticide-decisions. The EPA has also established a Scientific Integrity Committee to implement the EPA Scientific Integrity policy.

The ISDA pesticide enforcement cases, data collection and sampling protocols are based on approved quality assurance quality control ("QAQC") practices. Investigative and inspection reports are developed and submitted using EPA approved methodology. Certification and training ("C&T") is based on EPA standards, and are comparable to surrounding states. The ISDA's enforcement and C&T programs undergo an annual review by EPA to ensure that standards are maintained to meet EPA's requirements.

Section 22-101A (3) (a), Idaho Code. Identification of each population or receptor addressed by an estimate of public health effects or environmental effects.

The ISDA relied on information collected and analyzed by EPA, including the Human Health Risk Assessment for Pesticides and the Ecological Risk Assessment for Pesticides performed by the EPA to identify population receptors. EPA has developed a rigorous risk assessment protocol that estimates the probability of adverse health effects for people who may be exposed to pesticides from various activities. Pesticide exposure may occur in various situations, including the following:

The general public maybe exposed to pesticides, from residues left on fresh fruits and vegetables. Pesticide exposure can be more toxic to children and infants due to less established immune systems. The EPA establishes tolerances, based on a federal safety standard, to limit the amount of pesticide chemical residues that remain in or on food.

Pesticide exposure during pesticide applications may occur for agricultural workers and pesticide handlers. EPA's Agricultural Worker Protection Standard ("WPS") is aimed at reducing the risk of pesticide poisoning and injury among agricultural workers and pesticide handlers. The WPS requires owners and employers on agricultural establishments and commercial pesticide handling establishments to protect employees on farms, forests, nurseries, and greenhouses from occupational exposure to agricultural pesticides. Children from agricultural families and those living in close proximity to agricultural areas are exposed to higher levels of pesticides than those whose parents do not work in agriculture and who do not live close to farms. Adolescents working in agriculture are also at risk of exposure to pesticides. The incidence rate of acute occupational pesticide-related illness in adolescents is significantly higher compared to adolescents not working in agriculture. This is a particular concern for young farmworkers since adolescents are permitted to work in agriculture at younger ages than in other industries. While the research examining the impact of neurotoxicants on the central nervous system of adolescents is limited, there is strong evidence of neural remodeling and brain development during adolescence. Dose responses, metabolic rates and routes of exposure may vary by age, gender and maturation. Extra caution is merited as consideration is given to acute and chronic pesticide exposures of adolescents. *See* https://www.epa.gov/sites/production/files/2015-01/documents/rmpp_6thed_final_lowresopt.pdf

The general public may also be exposed to pesticides from drift. Pesticide spray drift is the movement of pesticide dust or droplets through the air at the time of application or soon after, to any site other than the area intended. Pesticide drift can be caused by many different factors, such as wind speed, temperature, droplet size, humidity, pressure, nozzle size and pesticide formulation. Pesticides can also drift through volatilization of the pesticide due to formulation, wind, humidity and temperature.

Section 22-101A (3) (b) and (c), Idaho Code. Identification of the expected risk or central estimate of risk for the specific population or receptor and identification of each appropriate upper bound or lower bound estimate of risk.

As previously stated, the ISDA relied on the Human Health Risk Assessment for Pesticides and the Ecological Risk Assessment for Pesticides performed by the EPA to identify risk factors associated with pesticide exposure to fulfill the statutory requirements for this rulemaking. Extensive data, scientific literature and research is available on the EPA website related to human health and environmental risk factors associated with unintended pesticide exposure. The process for assessing risk to human health was developed by the National Research Council and includes: (1) hazard identification (this examines whether a pesticide has the potential to cause harm to humans and/or ecological systems, and if so, under what circumstances; (2) dose response assessment (examines the numerical relationship between exposure and effects; (3) exposure assessment (examines what is known about the frequency, timing, and levels of contact with a pesticide; (4) risk characterization (examines how well the data support conclusions about the nature and extent of the risk from exposure to pesticides. *See* https://www.epa.gov/pesticide-registration/understanding-science-behind-epas-pesticide-decisions#process.

The upper risk level for each of the population receptors outlined above for pesticide exposure is death. Exposure may be the result of inhalation, dermal exposure or the ingestion of the pesticide. Pesticides have also caused the deaths of humans and animals due to pesticides not being stored in the proper or original containers. This type of poisoning is more common to children. Pesticides not stored in the original containers have also caused the deaths of livestock, due to mistaken feeding. The upper risk level for pesticides causing environmental harm may include acute and prolonged property damage to soil, crops, vegetation and surface and ground water. This can happen in the area of impact by exposure from spills, over application, misapplications, pesticide formulations, or cleaning of equipment. The lower bound risk for pesticide exposure is little to no effect to humans and to the environment.

Section 22-101A (3) (d), Idaho Code. Identification of each significant uncertainty identified in the process of the assessment of public health effects or environmental effects and any studies that would assist in resolving the uncertainty.

Pesticide risk evaluation is based on the frequency and magnitude of human and ecological exposures that may occur as a consequence of contact with pesticides, both now and in the future. This evaluation of exposure is then combined with information on the inherent toxicity of the chemical (that is, the expected response to a given level of exposure) to predict the probability, nature, and magnitude of the adverse health effects that may occur. In the ideal world, all risk assessments would be based on a very strong knowledge base (i.e., reliable and complete data on the nature and extent of contamination, fate and transport processes, the magnitude and frequency of human and ecological exposure, and the inherent toxicity of all of the chemicals). However, in real life, information is usually limited on one or more of these key data needed for risk assessment calculations. This means that risk assessors often have to make estimates and use judgment when performing risk calculations, and consequently all risk estimates are uncertain to some degree. For this reason, a key part of all good risk assessments is a fair and open presentation of the uncertainties in the calculations and a characterization of how reliable (or how unreliable) the resulting risk estimates really are. *See* https://www.epa.gov/risk/about-risk-assessment.

Section 22-101A (3) (e), Idaho Code. Identification of studies known to the director that support, are directly relevant to, or fail to support any estimate of public health effects or environmental effects and the methodology used to reconcile inconsistencies in the data.

The referenced studies support and are relevant to ISDA's identification of public health and environmental effects and will be included in the rulemaking record and can be reviewed during the public comment period for further detailed information regarding health effects.

Section 22-101A (4) The Director shall also include a summary of the information required by subsection (3) of the section in the notice of rulemaking required by chapter 52, title 67, Idaho Code.

Summary:

The ISDA has primacy to regulate the use and distribution of pesticides in Idaho under FIFRA. ISDA's pesticide enforcement actions are science based, and data collection and sampling protocols are based on approved practices. Certification and training is based on EPA standards, and meets the requirements to have reciprocation with other states for pesticide applicator licensing. Pesticides registered in Idaho must meet both federal and state requirements.

Idaho's pesticide programs help to educate and protect the public health and the environment from the possible effects of pesticides, based on established guidelines set by the EPA. Pesticide exposure can occur with agricultural workers, professional applicators and pesticide handlers during mixing and use. The general public and the environment can also be exposed to pesticides by pesticide drift or through pesticide contaminated ground and surface water. In the worst case, pesticides can cause death of the person exposed to the pesticide. Pesticides can also damage the environment from contamination of the soil, both surface and groundwater and cause the death of living microbes in the soil.

The references included in the rulemaking record support the methodology used in this rule.

References:

FDA - Food and Drug Administration - Pesticide Residue Monitoring Program Fiscal Year 2016 Pesticide Report U.S.
https://www.fda.gov/media/117088/download

FIFRA – Federal Insecticide Fungicide Rodenticide Act Manual
https://www.epa.gov/sites/production/files/2014-01/documents/fiframanual.pdf

FIFRA – Federal Insecticide Fungicide Rodenticide Act – Sections 150-180
https://www.ecfr.gov/cgi-bin/text-idx?SID=a9ba6ec73006de241381ee022d255252&mc=true&tpl=/ecfrbrowse/Title40/40cfrv26_02.tpl#0

Kansas State University Agricultural Experiment Station and Cooperative Extension Service – Factors Affecting Pesticide Behavior and Breakdown
https://www.bookstore.ksre.ksu.edu/pubs/MF958.pdf

Maryland Agronomy News – Pesticide Drift and Temperature Inversions - Jarrod Miller, Extension Educator, Somerset County
http://blog.umd.edu/agronomynews/2017/07/26/pesticide-drift-and-temperature-inversions/

NCBI - National Center for Biotechnology Information – Impact of pesticides on soil microbiological parameters and possible bioremediation strategies - Ashim Chowdhury; Saswati Pradhan; Monidipta Saha; Nilanjan Sanyal
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3450207/pdf/12088_2008_Article_11.pdf

NCBI - National Center for Biotechnology Information – Environmental Health Perspectives - The Synergistic Toxicity of Pesticide Mixtures: Implications for Risk Assessment and the Conservation of Endangered Pacific Salmon (2008) - Cathy A. Laetz,[1] David H. Baldwin,[1] Tracy K. Collier,[1] Vincent Hebert,[2] John D. Stark,[3] and Nathaniel L. Scholz[1]
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2661902/

NPIC – National Pesticide Information Center, - Pesticides and the Environment
http://npic.orst.edu/envir/

PES - Pesticide Environmental Stewardship – Introduction to Spill Management
https://pesticidestewardship.org/spills/introduction-to-spill-management/

PES - Pesticide Environmental Stewardship, Cornel University – Understanding the fate of pesticides after application
https://pesticidestewardship.org/water/pesticide-fate

University of Idaho - Pesticides in Idaho Groundwater: Monitoring, Protection, and Prevention – Robert L. Manler, Ronda E. Hirnyck, and Alex Colter
https://www.landcan.org/pdfs/CIS0861.pdf

U.S. Department of Agriculture, UF/IFAS Extension Service, University of Florida, IFAS, Florida A & M University Cooperative Extension Program, and Boards of County Commissioners Cooperating. Nick T. Place, dean for UF/IFAS Extension. - Managing Pesticide Drift
https://edis.ifas.ufl.edu/pi232

USDA Natural Resources Conservation Service January 1998 - Soil Quality Concerns: Pesticides
https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052821.pdf

USEPA – United States Environmental Protection Agency - Agricultural Worker Protection Standard (WPS)
https://www.epa.gov/pesticide-worker-safety/agricultural-worker-protection-standard-wps

USEPA – United States Environmental Protection Agency - Certification of Pesticide Applicators
https://www.federalregister.gov/documents/2017/01/04/2016-30332/pesticides-certification-of-pesticide-applicators

USEPA – United States Environmental Protection Agency - Food and Pesticides
https://www.epa.gov/safepestcontrol/food-and-pesticides

USEPA – United States Environmental Protection Agency - Introduction to Pesticide Drift
https://www.epa.gov/reducing-pesticide-drift/introduction-pesticide-drift#effects

USEPA – United States Environmental Protection Agency - Paraquat Dichloride: One Sip Can Kill
https://www.epa.gov/pesticide-worker-safety/paraquat-dichloride-one-sip-can-kill

USEPA – United States Environmental Protection Agency - Recognition and Management of Pesticide Poisonings Sixth Edition • 2013 - James R. Roberts, M.D., M.P.H. Professor of Pediatrics, Medical University of South Carolina J. Routt Reigart, M.D. Professor Emeritus, Medical University of South Carolina.)
https://www.epa.gov/sites/production/files/2015-01/documents/rmpp_6thed_final_lowresopt.pdf

USEPA – United States Environmental Protection Agency - Summary of the Federal Insecticide, Fungicide, and Rodenticide Act
https://www.epa.gov/laws-regulations/summary-federal-insecticide-fungicide-and-rodenticide-act

USGS – United States Geological Survey - Pesticides in Groundwater
https://www.usgs.gov/special-topic/water-science-school/science/pesticides-groundwater?qt-science_center_objects=0#qt-science_center_objects

USGS – United States Geological Survey - Pesticide National Synthesis Project – Pesticides in Surface Water
https://water.usgs.gov/nawqa/pnsp/pubs/fs97039//sw6.html