

Poster Articles

Drift Hazard Assessment Using CART – Cumulative Agrichemical Residue Tracking

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Abstract

The risks from off-site movement of agrichemicals as spray drift continues to be a concern from both economic and environmental points of view. Regulators set acceptable limits for residues, partly based on risk assessments, and these in turn lead to regulated or estimated buffer zones as a means of reducing risk from direct exposure to spray drift. However, the spray drift hazard is largely determined by the actions of the sprayer operator and site attributes at the time of spraying. Much is known about spray application and spray drift but this information is not readily available to an operator at the time of spraying. Development of a system to address these problems and the issues surrounding cumulative residues from multiple sources in areas of intense agricultural or horticultural activity has been initiated. The system is known as CART - Cumulative Agrichemical Residue Tracking, specifically relates to the application of pesticide sprays by ground based equipment and involves collection and management of spatial and temporal spray deposit data. It will have the ability to model single and multiple event scenarios, either in advance of the event, after the event or based on historical records. The application of pesticide residue dissipation rates in plant, soil and water will provide an estimate of the likely risk from the cumulative seasonal or geographical use of agrichemicals.

Components

The system will integrate predicted deposits and their fate from multiple applications, on the same or adjacent sites over a period of time (either seasonal or historical use). Such integration presents several technological problems. Geographic information systems (GIS) will provide the spatial context for climatic and soil information, as well as additional specific information for individual properties or sites. There is also a need to have good models of spray deposition, both within a target area, and outside it, as well as retention by the target crop. Dissipation models can then be applied to these residues (on different surfaces and environments) to estimate their persistence and whether there is an initial or eventual excess in any location above the prescribed targets or limits. While it is unlikely that all aspects of the system will be available at the required accuracy or reliability level e.g. predicting wind or shelter effects on off-site drift with 100% accuracy, the system will place all the factors which affect spray drift in context and in an accessible form relevant to the applicator. The function and value of such a system is dependent on the ability to interrogate the data for specific dates or over set periods and has multiple benefits from supporting individual operators and managers to development of risk scenarios for regulators by accessing use records and site specific information over larger regions.

The issues that CART targets are equally relevant to countries other than New Zealand. To allow CART to be readily run in a different country with that country's own databases, a "data broker" architecture will be employed. New databases can easily be linked to the data brokers and CART can then immediately utilise those databases.