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FERTSPREAD – A TOOL FOR ON-FARM FERTILISER APPLICATOR CALIBRATION

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Introduction

The Sustainable Farming Fund "On-Farm Fertiliser Applicator Calibration" project arose from repeated requests by farmers for a quick and simple way to check performance of fertiliser spreading by themselves or contractors. Project outputs are available at www.fertspread.nz.

Farmers and agronomists had noticed striping in crops, especially when spreading bout widths increased to match wide sprayer bouts. Visible striping is indicative of very significant non-uniform distribution and yield loss.

Massey University research indicates striping is only visible when in-field nutrient coefficient of variation CV exceeds about 40%. At this point, non-uniform application gives a yield reduction of at least 20%. The economic impact increases exponentially as in-field CV increases, so if the CV doubles, there is four times the economic loss. If CV triples, there is nine times the economic loss[i, ii].

Fertiliser applicator manufacturers provide guidelines to calibrate equipment and some newer machines automatically adjust to correct distribution pattern based on product properties and comparing a test catch with "factory" test data.

A calibration check includes assessment and correcting of both actual fertiliser application rate (kilograms/hectare) and the field application uniformity (measured as the coefficient of variation, CV). Farmers indicate determining the rate is reasonably easy and commonly done. Very few report completing any form of uniformity assessment.

Fertiliser application calibration procedures suitable for farmers applying nutrients with their own equipment have been developed. Guidelines and a web-based calculator support on-farm checks to ensure and demonstrate application equipment is performing to expectations. They also aid the self-audit component of *Spreadmark*®.

Testing Protocols

A range of test protocols were considered. National and international practice uses baffled test trays set across a sample transect, collecting fertiliser applied by a moving spreader. Details were presented at Fertiliser and Lime in 2015[iii].

Guidelines for farmers have been developed and are available as a download from the *FertSpread* website. The guidelines are designed to allow a farmer to rapidly determine

performance of a spreader as it is operating on a given day, with a given product in prevailing weather conditions. If any factor changes, the results are likely to be different.

FertSpread On-line Calculator

Then on-line calculator *FertSpread* was developed to process field collected fertiliser spread data and generate performance reports. Site user guidelines and a recording sheet template are available as downloads from the site.

FertSpread calculates uniformity from data from a single pass and mathematically applies overlap using both to and fro and round and round driving patterns. Weighing samples involves very small quantities so scales weighing to 0.01g are required. Satisfactory options are readily available at reasonable price.

An alternative approach uses small measuring cylinders or syringe bodies to compare applied volumes. While not able to assess alternative driving patterns, this can give a direct and very visual immediate view of performance.

Test spread-pattern checks performed to date show there is a need for wider testing by farmers. Unacceptable CVs and incorrect application rates are the norm.

The efficiency of catch trays is called into question. While we believe the collection tray data is acceptable to assess evenness of application, the application rate should be determined by direct measurement of weight applied to determined area.

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