

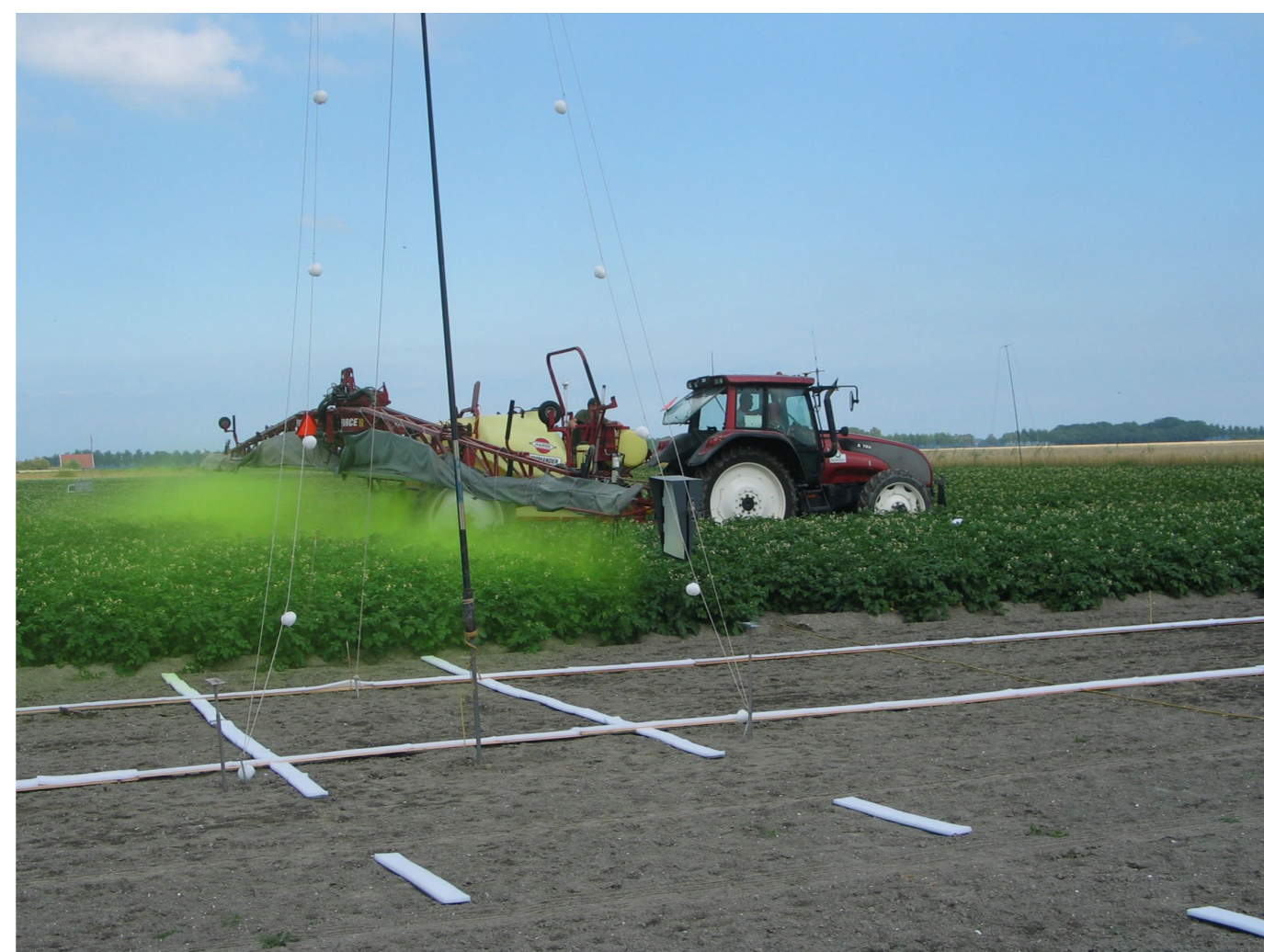


# The WUR Drift Calculator for estimating downwind deposits of spray drift

Henk Jan Holterman, Jan van de Zande

## Background

In the authorization procedure of plant protection products (ppp), downwind deposits of spray drift must be quantified. In 2003 the IMAG Drift Calculator was developed to compute such deposits onto edge-of-field waterbodies. Recently, it was thoroughly renewed, improved and expanded resulting in the **WUR Drift Calculator (WDC)**.



## Objective

Development of a useful tool to compute downwind deposits of spray drift in downward spray applications (arable crops) and upward & sideways applications (fruit tree orchards, avenue tree nurseries). The calculator uses spray drift curves to compute downwind spray deposition next to the sprayed parcel. These curves are statistically obtained regression curves derived from experimental data on drift deposition for field crops, fruit orchards and avenue tree nurseries.

## Introduction

The WDC has two major evaluation goals: evaluation of spray drift deposition onto:

- (1) an edge-of-field *watercourse* next to a treated crop: exposure of waterbodies to pesticides;
- (2) off-field *terrestrial zones*: exposure of non-target terrestrial plants (NTP) and arthropods (NTA) to pesticides.

These goals apply to field crops (downward spraying) and fruit orchards & avenue tree nurseries (upward & sideways spraying); see Fig. 1. Drift mitigation measures such as additional DRT buffer zones and the use of drift reducing application techniques (DRTs), can be selected as well.

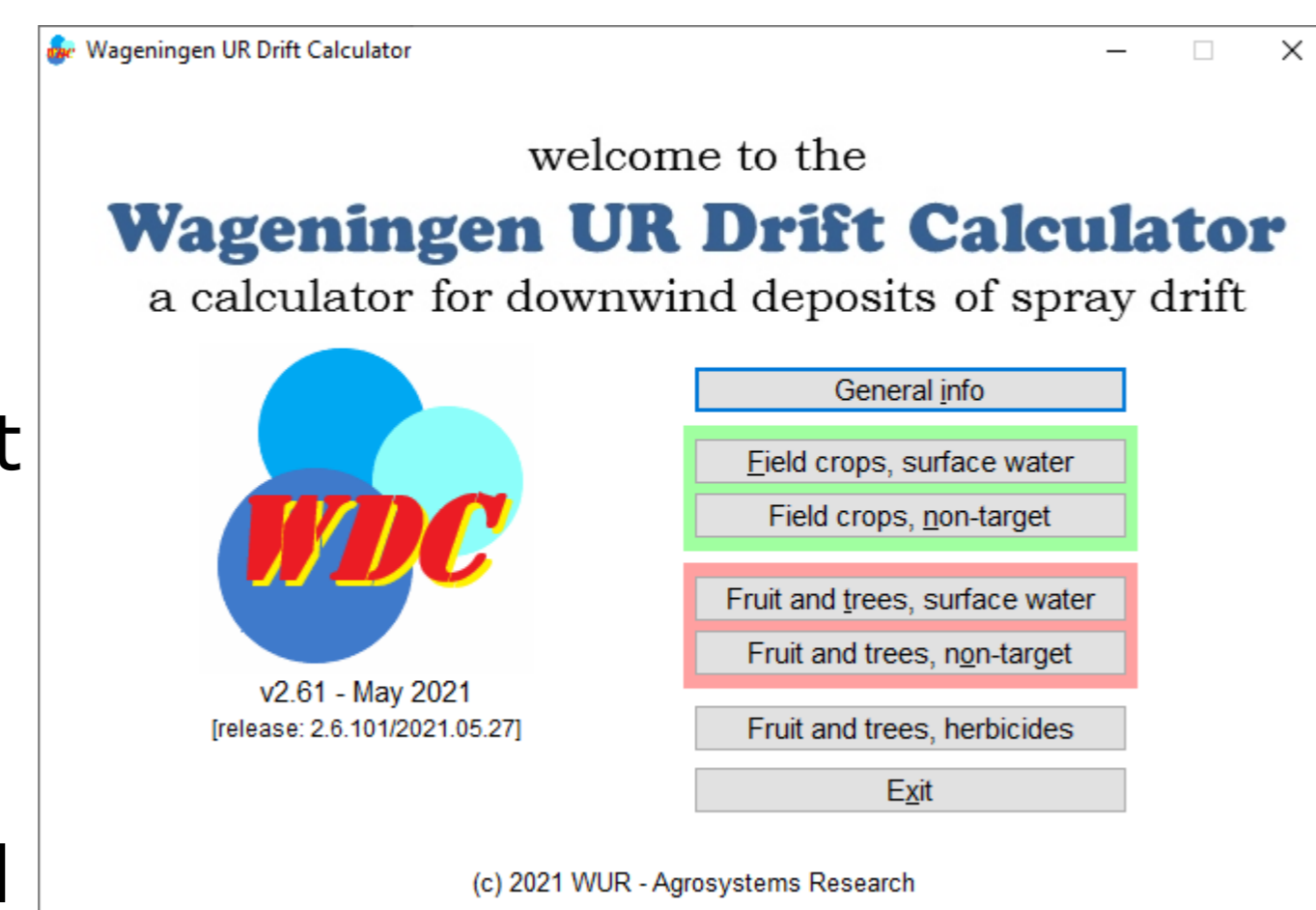


Figure 1. Entry screen of the WDC software.

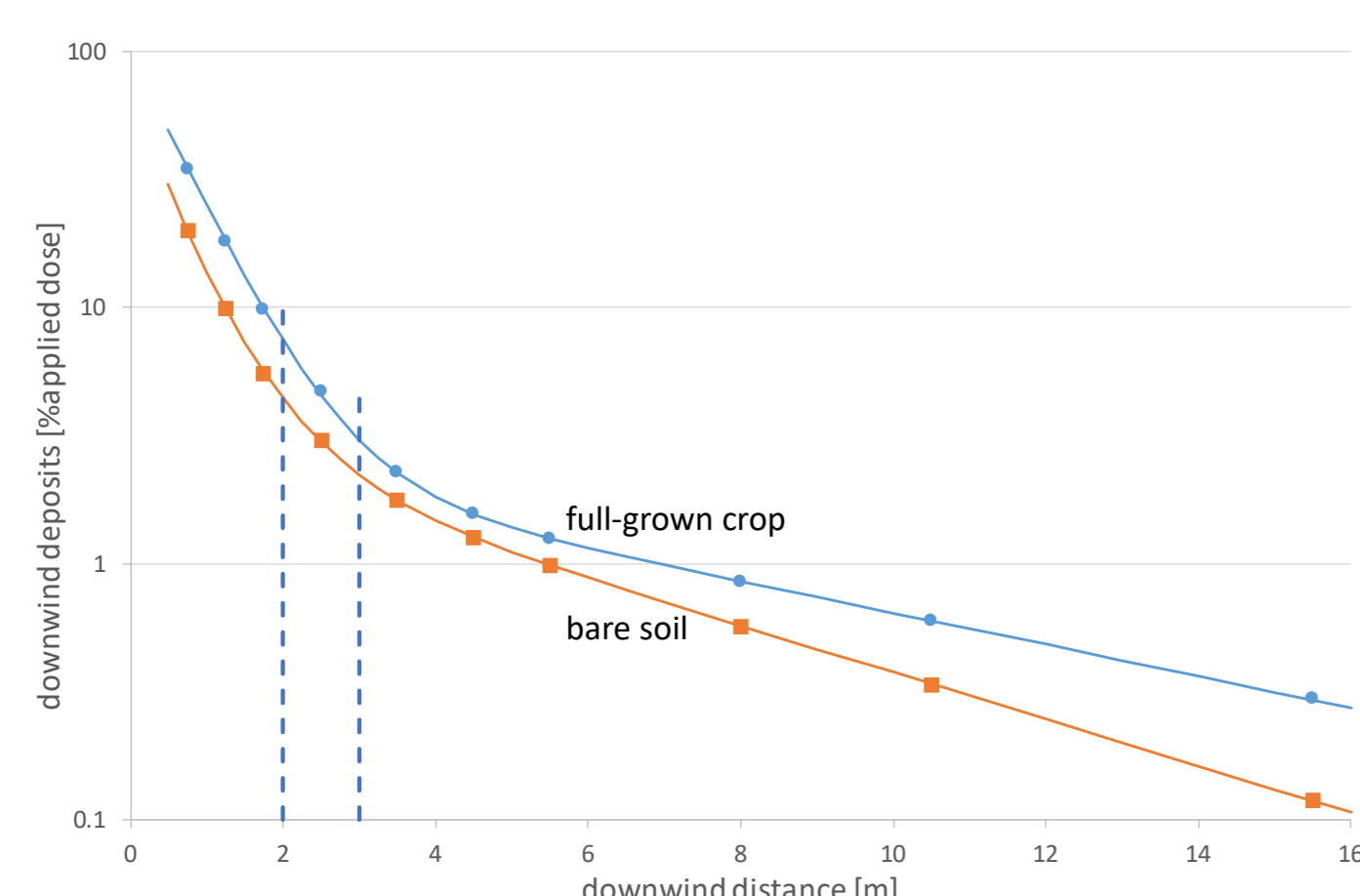


Figure 2. Drift curves for downwind deposits next to field crop (downward spraying). For bare soil and full-grown crop (0.5 m height). Dashed lines indicate location of watercourse.

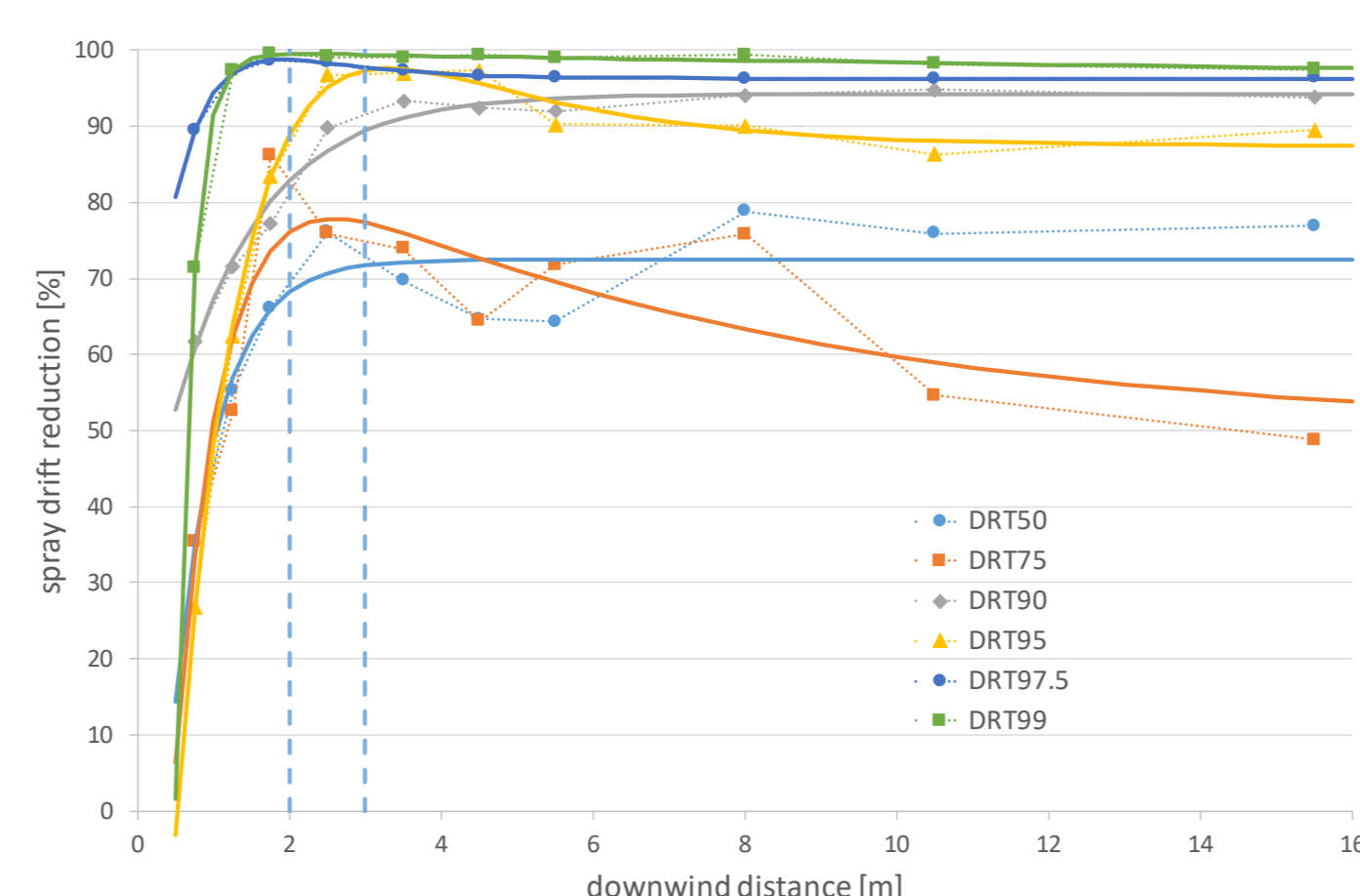


Figure 3. Drift reduction curves: reduction as a function of downwind distance, for different mitigation classes (DRT).

## Methods

Downwind spray deposits are computed using drift curves for a standard spray application (Fig. 2), together with drift reduction curves (Fig. 3). The distance where drift deposits are to be evaluated depends on crop type, crop stage and evaluation goal (Fig. 4, Fig. 5).

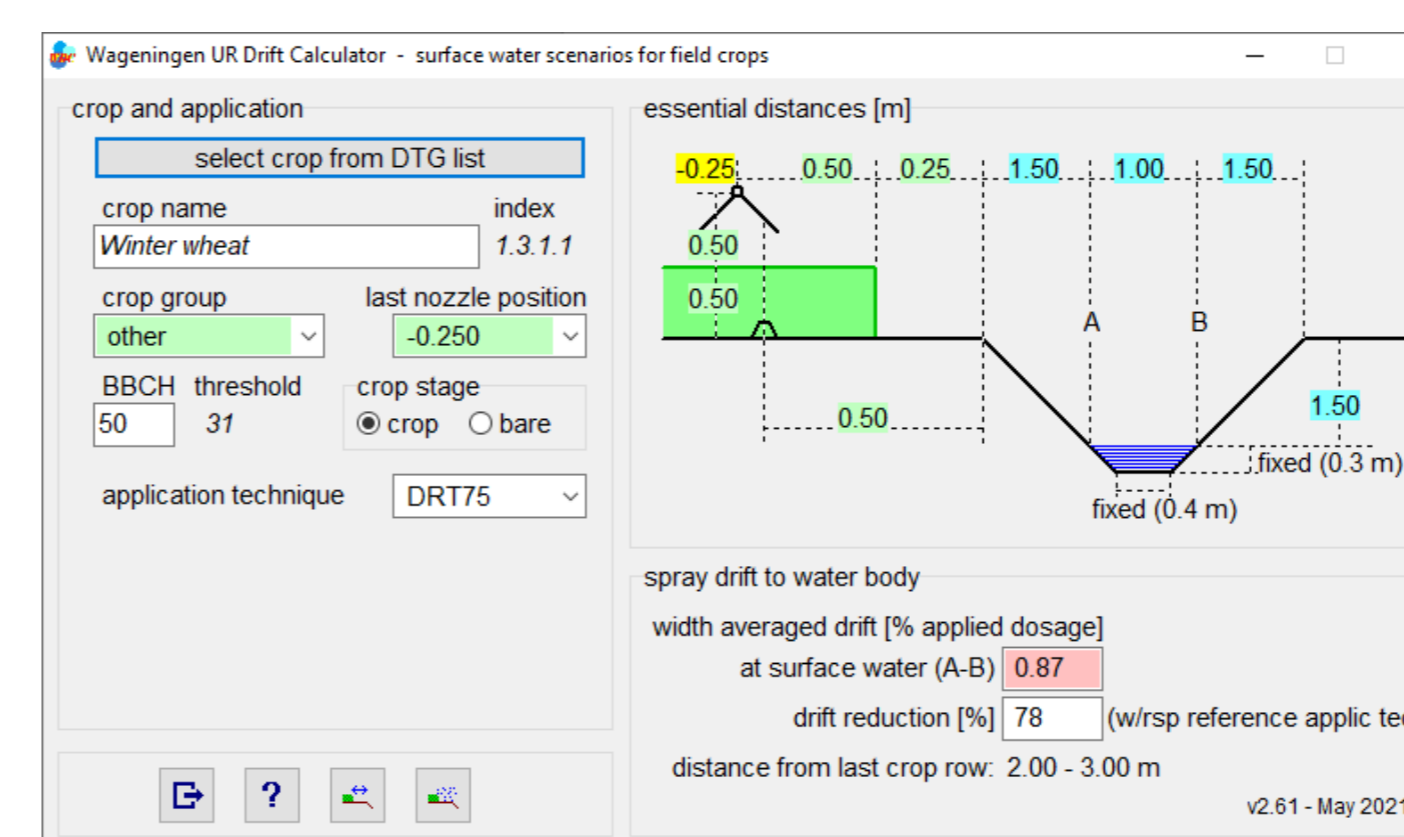


Figure 4. Drift evaluation on watercourse next to arable crop (full-grown winter wheat); DRT75 spray application technique.

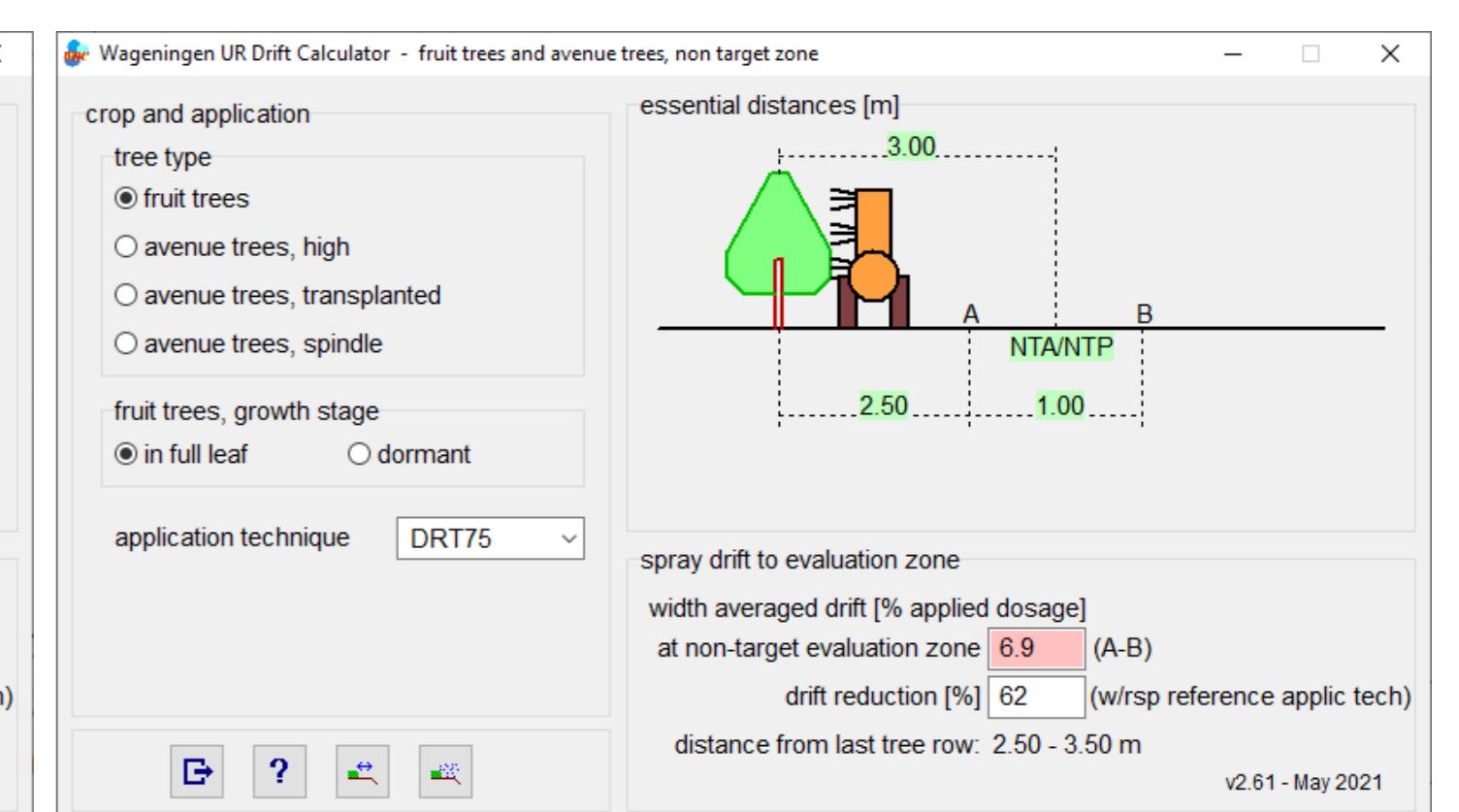


Figure 5. Drift evaluation at non-target terrestrial zone, next to fruit orchard in full leaf; DRT75 spray application technique.

## Software

- WDC can be downloaded at <https://fieldtechnology.nl/> for free; it includes manual and off-line help file
- Manual also available at <https://edepot.wur.nl/538877>



## Summary

- The WUR Drift Calculator computes downwind deposits of spray drift for arable crops, fruit orchards and avenue tree nurseries in NL
- Evaluation of spray drift deposition on off-field watercourses and non-target terrestrial zones
- Primary objective: exposure evaluation for regulatory purposes
- Drift mitigation measures are incorporated
- Drift deposition curves and drift reduction curves are derived from experimental data by regression analysis
- Since January 1, 2022, using the WDC is mandatory in the authorisation procedure for plant protection products in The Netherlands.

## Acknowledgements

We are grateful to the Dutch Ministry of Agriculture, Nature and Food Quality (LNV) for funding this research and software development; project number BO-43-011.01-007.

