Silsoe Spray Drift Model

Installation and User Guide

Trial version

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Contents

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Installation

The program has been emailed as an '.msi' file as an attachment.

Click on this attachment to run it. The installation wizard will pop up.

The default directory is C:\program files\TAG\spray model. You can change this if you wish.

When it has finished being installed, it can be run by clicking on your pc's START button:

START-> All programs -> Silsoe Field Model   (probably right at the bottom of the list)

You can right-click on the *Silsoe Field Model* icon and create a shortcut which you can drag on to your desktop.

Running the model

At start-up, the 'Nozzle Parameters' tab will be showing.

Click on the drop-down menu under **select nozzle type:** and choose the nozzle type (currently four included, based on BCPC classification boundary nozzles).

All parameters except the droplet size and velocity distributions can be changed at this point, but they have been set to the current optimum values, so this isn't recommended.

Click on the 'environment parameters' tab and select the values you want. They are currently set to reasonable defaults.

Click on 'output parameters' and select the values you want. It is not recommended to change the number of strings and the maximum string height. 'Poles' relates to the positions downwind where the data will be output (this historically relates to our field trials, where airborne spray was measured by lines attached to a pole)

Click on the *run simulation* button to run the model.

When the model has finished running, the results will appear in the simulation window
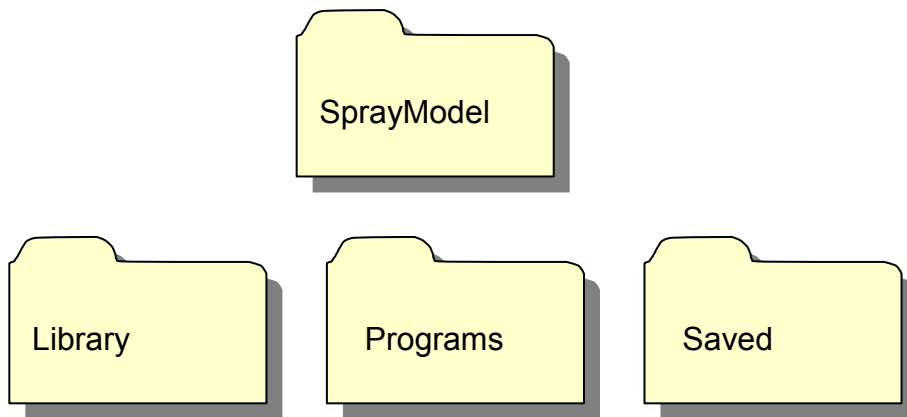
Across the top are the pole numbers

In order to save this data, you need to click on the *save file* icon, or click on

> *file -> save as.*

Saving data and file storage

In the directory where the model is stored there is the following structure:

SprayModel

Library   Programs   Saved

Library folder

Contains the nozzle files, and other default data. New library files can be created by changing parameters, then clicking on

File->Export library

Any new nozzle data should be placed in this folder to be available to the program.

The nozzle files that are provided relate to the BCPC classification boundary nozzles

Saved folder

This contains all the saved files by default— both input parameters that can be used again to run the model and the results of the simulations.

To save parameters so that they can be used again:

Either click *File -> Save nozzle/environment/output parameters*

Or, when on the relevant tab, click the *save* button

Or to save the three lots of parameters in a single file, click *File -> Save.*

In order to use the saved parameters in running the Silsoe Field Model program,

Either click on the *open file* button on the relevant tab,

Or click *File -> Open nozzle/environment/output parameters*

Or to open a file that contains all three lots of parameters, click *File -> Open*

Saving results of simulations

To save the results of the simulations, click on the *file save* button,

or click on *File -> Save results* and choose an appropriate filename and location.

Two text files are created when the results are saved:

1. **Input parameters** (filename inputs.txt). This is in a rather complex format, but can be read back in again as an input file if necessary, if you change its extension to .taginp (not recommended though). All the parameters that were used to run the model are buried in here. Over-written if you use the same file name.

2. **Vertical drift profile** (filename.vert_profile). Ordinary text file but can be read into Excel by right-clicking on it and *Open with -> Excel*. Gives pole positions along top row, height positions down left hand side. Units are ml spray liquid/ m^2. Over-written if you use the same file name.

Model Variables

Each variable has an acceptable range, denoted in the tables below. This range is provided in order to reduce the possibility of errors, such as using the wrong units or mistyping a number. It does not indicate the range for which the model predictions are valid, or even that the model will run, although where values are known to cause the program to crash, the range has been appropriately restricted.

Please note that, should you enter a value outside the allowable range, the program will re-set it to within the range but will not explicitly alert you that it has done this. It will record in the 'input' file the value that was actually used, however.

Nozzle variables	Description	Possible range
Q	Flow rate, l/min	0—10
SSFx	Velocity scaling factor in x direction, dimensionless	0—5
SSFy	Velocity scaling factor in y direction, dimensionless	0—5
Lpx	Porosity length in the x direction, m	0—3
Lpy	Porosity length in the y direction, m	0—3
C1	Half the wide fan angle, degrees	5—180
C2	Half the narrow fan angle, degrees	4—180
Vl0	Liquid sheet velocity, m/s	0—50
r0	Distance from the nozzle of droplet origin, mm	0—500
RHOl	Density of droplets, kg/m3	100—2000

Environment variables	Description	Possible range
s	Nozzle spacing, m	0.1—5
psi	Nozzle offset, degrees	0—90
h	Height of boom above crop, m	0—5
Ch	Height of crop, m	0.01—3
Fs	Forward speed, km/h	2—30
Ws3m	Wind speed 3 m above the ground, m/s	0.1—25
Nnozzles	Number of nozzle: number of nozzles on boom x number of upwind passes	1—1000
Vh	Height of vegetation in a 2m strip at the edge of the field	0.01—3.0
Gh	Height of vegetation downwind of field margin	0.01—3.0
wbd	Wet bulb depression, degrees Celsius— NOT AVAILABLE	0—35
delta	Angle of wind to travel direction, degrees	5—175

Output variables	Description	Possible range
np2	Number of output poles	0—500
maxpd	Maximum pole distance, m	1—500
nh	Number of strings	5—100
maxsh	Maximum string height, m	0.2—100

Terms and conditions

The model is supplied under the following terms, dated 09.07.12.

The model is under development and therefore its content and operation cannot be guaranteed. Sections of the model are being validated as it is developed but any versions supplied will not necessarily have been validated as an overall model.

Support for using the model can only be supplied by SSAU on an ad-hoc basis, subject to availability of resources, and there is no guarantee that any problems can be addressed or solved – it is most likely that problems will only be addressed in future versions of the model.

Any results generated by the model are for personal research use. No publication of results, or reference to results, generated by the model can be made without the prior permission of the Head of Silsoe Spray Applications Unit.