



## **Marshall Multispread App Fine Tuning Application Rate Parameters**

### **Background**

This document outlines a procedure for adjusting fertiliser density to fine tune application rate within the Multispread MDC iPad Application. The fertiliser density provided within the app is a guide only and it should be fine tuned over the first load. To setup a new fertiliser type a measured fertiliser bulk density in kg/m<sup>3</sup> or the value provided by the fertiliser supplier is required.

## **Disclaimer**

The Marshall Multispread is to be used in the Agricultural and Horticultural industries to apply granulated and non-granulated fertilisers. It is very important that you follow the Calibration procedures and Operating instructions contained within the Marshall Multispread app before use. Calibration and operation of the Marshall Multispread must be in accordance with these instructions. Use of the Marshall Multispread app is subject to the following disclaimer;

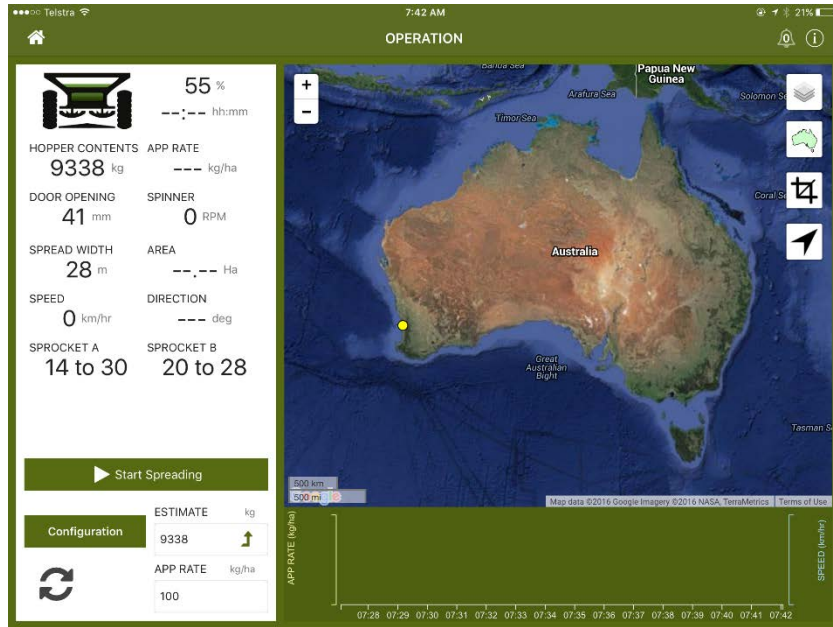
So far as is legally permissible Roesner Pty Ltd, or its distributors, shall not be liable, whatever the cause, for any increased costs, loss of profits, business, contracts, income, or anticipated savings or for any special, indirect or consequential damage;

The capabilities and functions of the Marshall Multispread are limited as set out in the specifications within this app and the standard operators manual;

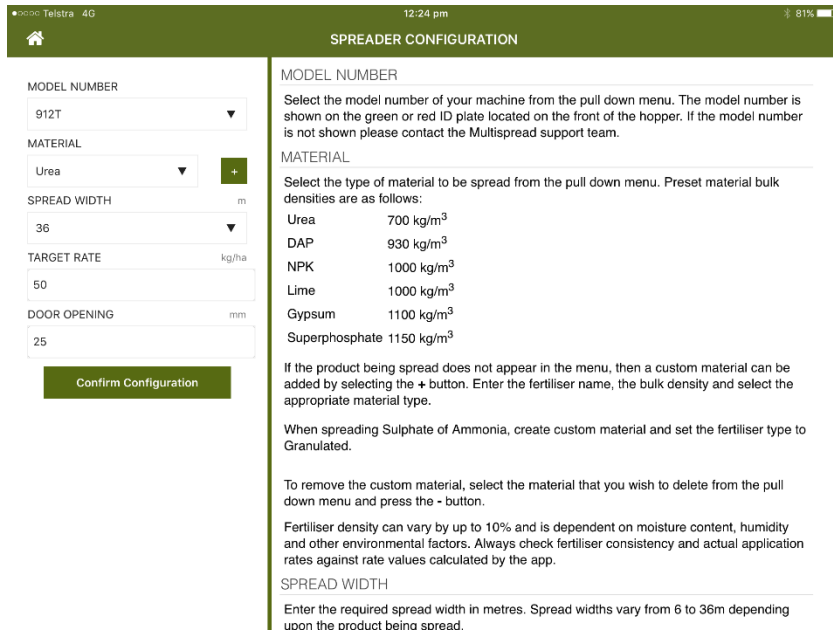
Without prejudice to the above it is hereby acknowledged that the Marshall Multispread is not designed nor intended to achieve application rates and spread widths outside the parameters calculated by the Marshall Multispread app.

## INITIAL SETUP

Step 1 : From the Operation screen, tap **CONFIGURATION**

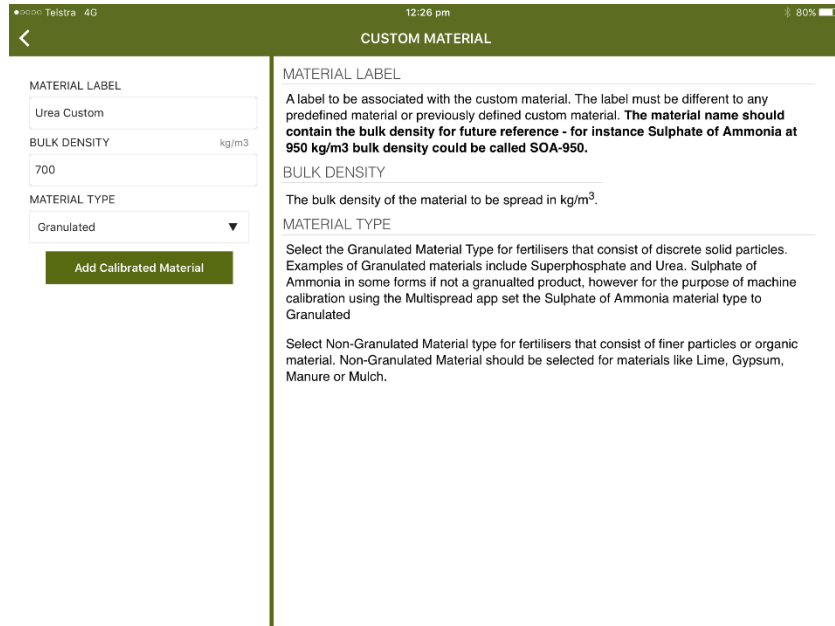


Step 2 : Select the MODEL NUMBER from the Pull DOWN List

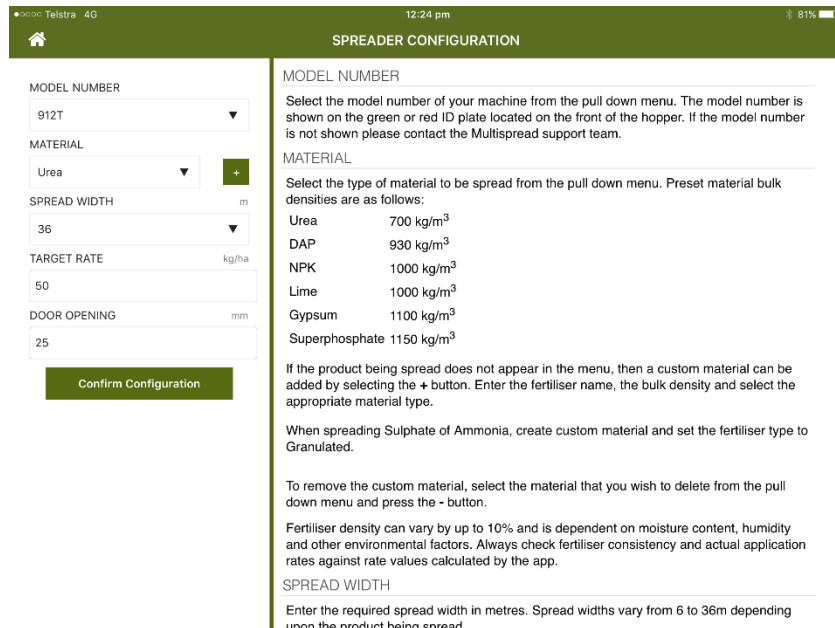


Step 3 : Create a new MATERIAL by tapping the **+** key next to the MATERIAL pull down.

Step 4 : Enter a label for the new material eg: **Urea Custom**, the bulk density from the fertiliser supplier documentation eg : **700 kg/m<sup>3</sup>** and the material type eg **Granulated**. Then tap **ADD CALIBRATED MATERIAL**



Step 5 : Choose Urea Custom from the material pull down menu. Enter the spread width, target application rate and hopper door opening. The table below outlines suggested door openings for different fertiliser types, spread widths and ground speeds.



Step 6 : Tap **Confirm Configuration** to calculate the target belt speed to achieve the target application rate and to return to the Operation screen. If a door actuator is fitted the door will be driven to the requested opening. If the door actuator is not fitted, manually set the door to the requested opening.

## SUGGESTED DOOR OPENINGS

Product	Door Opening (mm)	Speed Range (km/h)	Spread Width Range (m)	App Rate Range (kg/ha)
Urea	25	12 – 24	18 – 36	50 – 150
Superphosphate	30	14 – 25	18 – 36	70 - 250
Lime/Gypsum	75	13 – 20	6 – 12	500 - 2100

## STARTING WORK

Load the hopper with the fertiliser and record the hopper contents (from the loadcells) whilst the spreader is stationary.

Drive the spreader for at least 2 Ha for Lime and Gypsum and 10 Ha for Urea, Superphosphate or another granular fertiliser, recording the area from the tractor GPS and the app operating screen.

Stop the spreader and record the hopper contents (from the loadcells) and the area spread.

## DETERMINING ACTUAL APPLICATION RATE

To determine the actual application use the following formula :

$$\text{Actual App Rate} = \frac{\text{Initial Hopper Contents(kg)} - \text{Final Hopper Contents(kg)}}{\text{Area Covered (Ha)}}$$

For example :

Initial Hopper Load	9545 kg
Final Hopper Load	8995 kg
Amount Spread	550 kg
Area	10 Ha
Actual Application Rate	55 kg/ha

## FINE TUNING APPLICATION RATE

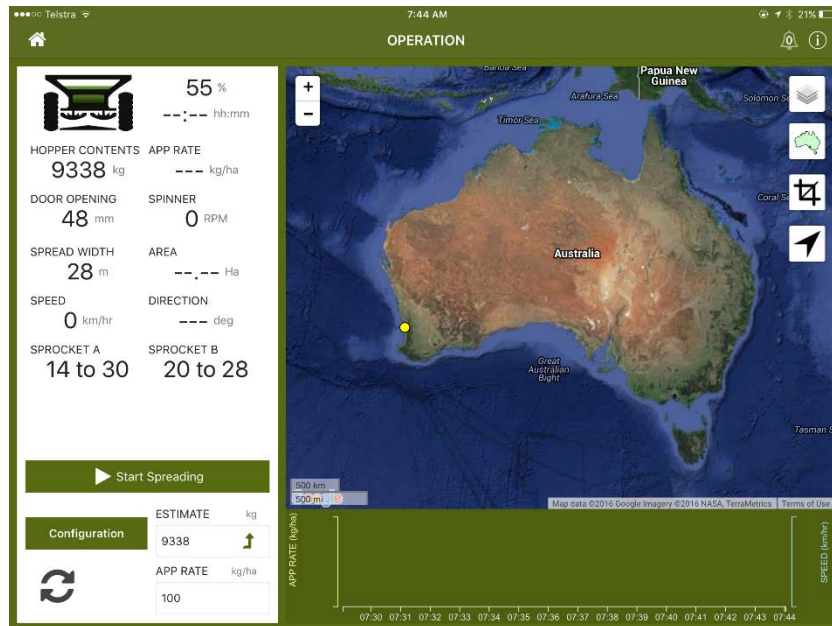
To fine tune the application rate the fertiliser density is recalculated. To recalculate the bulk density the following formula is used :

$$\text{New Bulk Density} = \frac{\text{Actual Application Rate}}{\text{Target Application Rate}} \times \text{Initial Bulk Density}$$

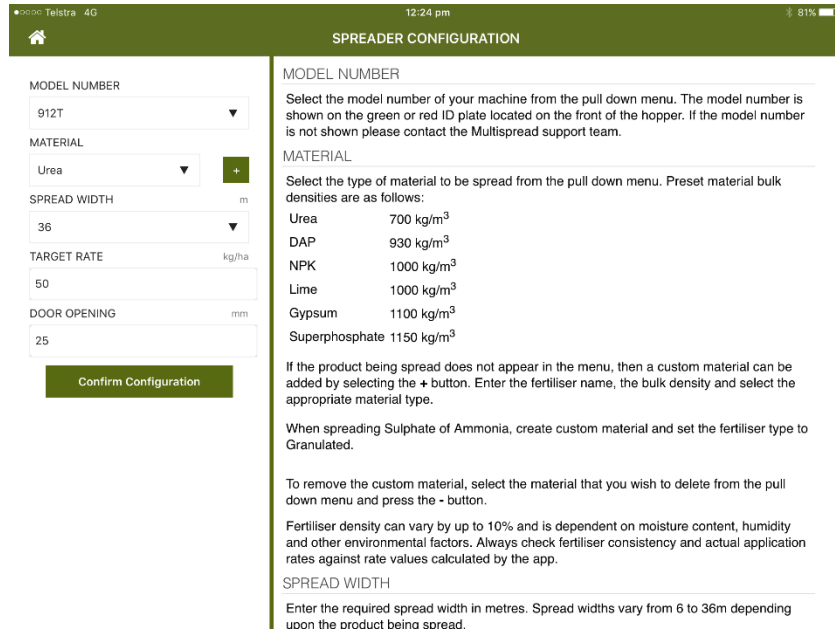
Actual Application Rate	55 kg/ha
Target Application Rate	50 kg/ha
Initial Bulk Density	700 kg/m <sup>3</sup>
New Bulk Density	770 kg/m <sup>3</sup>

## ENTERING THE NEW BULK DENSITY INTO THE MDC APP

Step 1 : From the Operation screen, tap **CONFIGURATION**

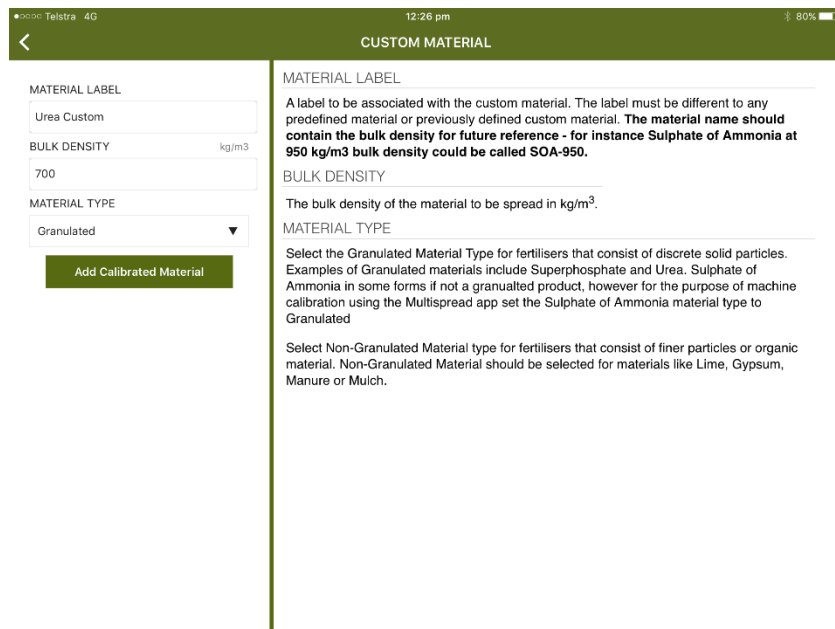


Step 2 : Select the material from the pull down menu, **Urea Custom** and tap the **-** key next to the MATERIAL pull down. This deletes the previous Potash custom material.

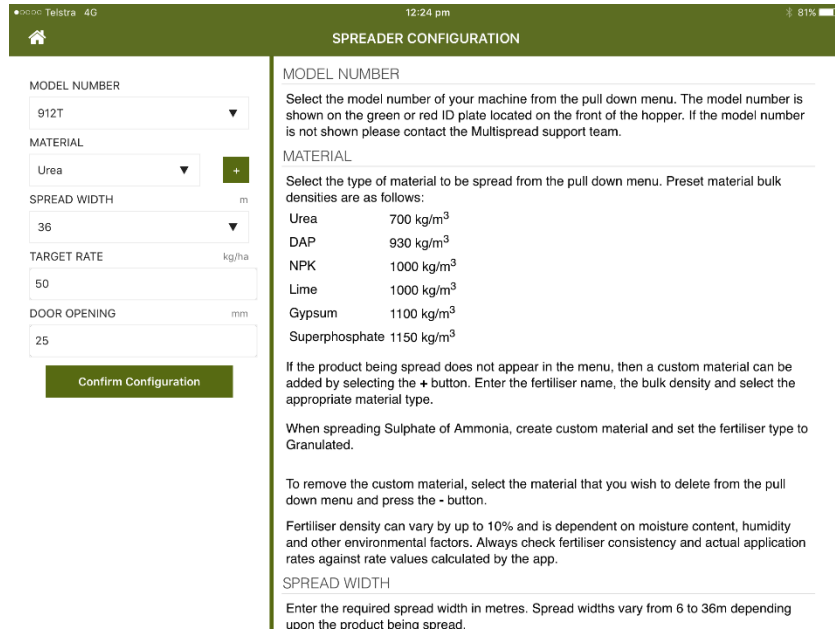


Step 3 : Create a new MATERIAL by tapping the **+** key next to the MATERIAL pull down.

Step 4 : Enter a label for the new material eg: **Urea Recal**, the bulk density **eg : 770 kg/m3** and the material type **eg Granulated**. Then tap **ADD CALIBRATED MATERIAL**



Step 5 : The app then returns the Spreader Configuration Screen, Tap **Confirm Configuration**, to return to the Operation Screen.



The app will re-calculate the target belt speed and when starting work the new target belt will be used to control the spreader feedbelt.

**NOTES :**

To fine tune the default fertiliser types installed in the app including Superphosphate, DAP, NPK, Urea, Lime and Gypsum use the following initial bulk densities :

Fertiliser Type	Bulk Density
Urea	811.3
DAP	1057.7
NPK	1153.8
Super	1201.9
Lime and Gypsum	1051.7

The initial bulk densities are based on a large number of physical tests and they vary from the bulk density values quoted by fertiliser suppliers. These variations are caused by changes fertiliser consistency and how each product flows through the spreader feed door.

It is important that NON-GRANULATED and GRANULATED material types are selected when creating a new material.