

## *ENTAM - Test Report*



Sprayer type:  
Trade mark:  
Model:

Self propelled field crop sprayer  
AGCO  
RoGator RG 645

**Manufacturer:**  
AGCO Netherlands B.V.  
Horsterweg 66  
5971 NG Grubbenvorst  
Netherlands  
June 2011

**Test report: D - 1898**

|                         |
|-------------------------|
| <b>Assessment table</b> |
|-------------------------|

| No. | Contents  | Assessment |
|-----|---|------------|
| 1   | Spray tank surface roughness  | ++         |
| 2   | Spray tank over volume  | +          |
| 3   | Volume of total residual  | +          |
| 4   | Spray tank contents gauge up to 20% Filling                                       | +++        |
| 5   | Spray tank contents gauge from 20% Filling  | +++        |
| 6   | Agitation system  | +          |
| 7   | Width of nozzle bar section   | ++         |
| 8   | Boom height adjustment range  | +++        |
| 9   | Accuracy of pressure gauge  | +++        |
| 10  | Accuracy of flow meter  | +++        |
| 11  | Regulation speed  | ++         |
| 12  | Even transverse distribution  | +++        |
| 13  | Rinsing water tank  | +          |
| 14  | Deviation of volume/hectare adjustment device (spray computer) from desired value | +++        |
| 15  | Repeatability of volume/hectare adjustment device (spray computer)                | ++         |
| 16  | Pressure drop between manometer and nozzle  | +++        |
| 17  | Deviation of single nozzle output from table                                      | ++         |

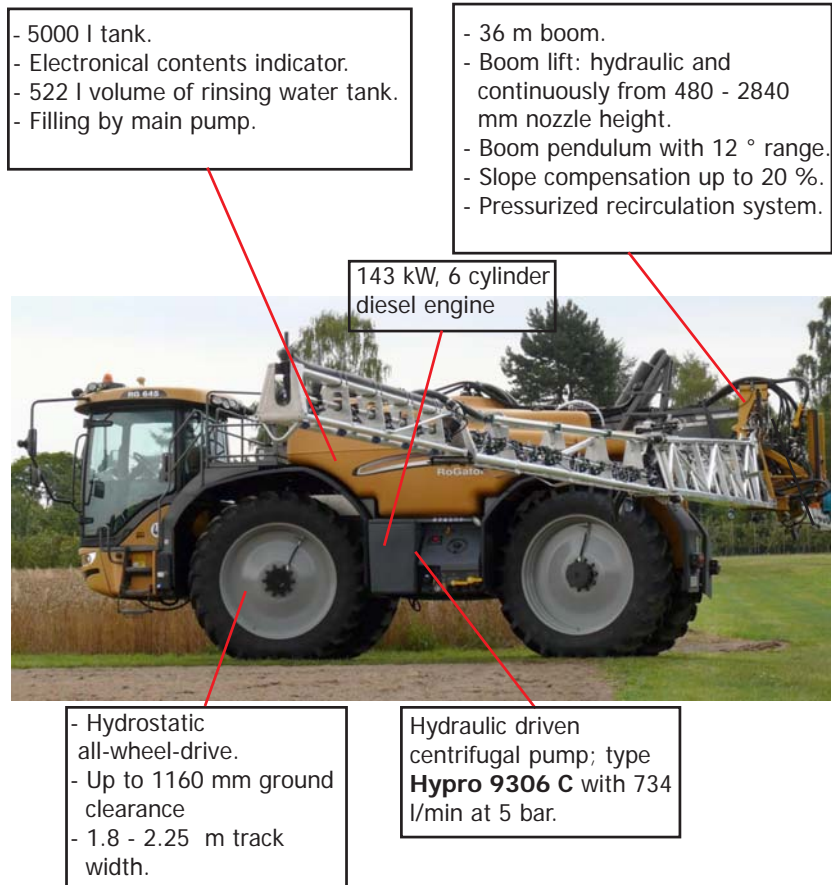
Fig.1+2: Assessment table and assessment keys of important test results.

Note: The assessment keys are listed below. The detailed results are in the following test report.

| No. | unit           | +          | ++         | +++       | No. | unit           | +     | ++      | +++    |
|-----|----------------|------------|------------|-----------|-----|----------------|-------|---------|--------|
| 1   | µm             | >70-100    | 30-70      | <30       | 10  | %              | 4-5   | 2-4     | 0-<2   |
| 2   | %              | 5-8        | >8-12      | >12       | 11  | s              | >4.7  | 2.3-4.7 | 0-<2.3 |
| 3   | of allow.value | >2/3-3/3   | 1/3-2/3    | <1/3      | 12  | CV             | >7-9  | 4-7     | <4     |
| 4   | %              | 7.5-5.0    | 5.0-2.5    | <2.5      | 13  | % of tank vol. | 10-12 | >12-14  | >14    |
| 5   | %              | 5.0-4.0    | <4.0-2.0   | <2.0      | 14  | %              | >4-6  | 2-4     | <2     |
| 6   | %              | >10-15     | 5-10       | <5        | 15  | %              | >2-3  | 1-2     | <1     |
| 7   | m              | >4.5-6     | >3-4.5     | 3 or less | 16  | %              | >7-10 | 3-7     | <3     |
| 8   | m              | 1-1.5      | >1.5-2.0   | >2.0      | 17  | %              | >7-10 | 3-7     | <3     |
| 9   | bar            | >0.10-0.20 | >0.05-0.10 | 0.00-0.05 |     |                |       |         |        |

Free download of the test under: [www.ENTAM.net](http://www.ENTAM.net)  
or [www.jki.bund.de](http://www.jki.bund.de)

### Technical data of sprayer



#### Dimensions and weights:

|               |          |
|---------------|----------|
| total length: | 9250 mm  |
| height:       | 3980 mm  |
| width:        | 2550 mm  |
| total weight: | 12060 kg |

Fig.3: Diagram of sprayer.

### Description of sprayer

The RoGator RG 645 is powered by a 143 kW 6 Cylinder diesel engine from SISU (tested version). Different engines from 121 KW (4 cylinder) to 160 KW (6 cylinder) are available. The wheel drive is realised by a hydrostatic all-wheel-drive.



Fig.4: The engine at the right sprayer side.

The cabin is equipped with

air conditioning, a charcoal filter is optional. The gearbox has two speed ranges „Feld“ (means „field“ with up to 20 km/h) and „Straße“ (means „street“ with up to 40 km/h). In the field modus all wheels can be steered and the track width can be adjusted hydraulically between 1.8 m and 2.25 m (during slow driving). The ground clearance of 1.16 m and a mostly smooth floor pan shall prevent plant damages. The backbone of the RoGator is formed by a tubular steel frame with a built on 5000 l polyethylene tank without splash walls. The sump is placed in the centre of the bottom section so the amount of residual is independent of the



Fig.5: The smooth floor pan with up to 1.16 m ground clearance.

direction of inclination of the sprayer. The liquid content in the tank is calculated from the measurement by a pressure sensor at the tank bottom. The measured / calculated tank content is displayed on a display in the cabin and on the control panel at the left sprayer side.

### Description of sprayer



Fig.6: Left sprayer side with control panel and induction hopper.

For inner tank cleaning 6 rotating cleaning nozzles are located in the tank. The sprayer is equipped with a pressurized agitator. The agitation intensity can be adjusted between 0 % and 100 % from the control panel, for reducing the amount

of residual, the sprayer can work with switched of agitator. For diluting and cleaning purposes the sprayer is equipped with a 522 l wash water tank. The spray tank can be filled via the hydraulic driven Hypro 9206 C centrifugal pump. The pump is able to fill the tank with 920 l / min (at 3 bar). The plant protection product can be transported into the tank by an induction bowl with integrated rotating product container rinsing nozzle at the left sprayer side.

The boom with 36 m working width is lateral folded and made of a tubular aluminium framework, divided in 7 mechanical and 10 hydraulic (spraying) sections. The mechanical sections have a width between 2.55 m and 4.5 m.



Fig.7: Nozzle station at the boom.



### Description of sprayer



Fig.8: Moving of the outer boom section because of getting in contact with obstacle.

The outer sections with a 2.55 m length can avoid damage because of obstacles by moving forward, backward or upward in case of obstacle contact. The boom height can be adjusted hydraulically and infinitely by a central lift in a range between 0.48 m and 2.84 m.

It comprises a central pendulum with a pendulum range of up to  $12^\circ$  and hydraulic incline adjustment up to an inclination of 20 %. The liquid circuit is equipped with a pressurized recirculation system with pneumatic single nozzle switching. The liquid tubes are made from stainless steel. The framework construction of the boom protects the nozzles from ground contact.

The sprayer is equipped with a spray computer „TOPCON“ with a separate backlit display, so spraying data and driving (machine) data can be seen at the same time.



Fig.9: „TOPCON“ backlit display.

| Result table          |  |                    |  |   |                                    |
|-----------------------|--|--------------------|--|---|------------------------------------|
| tested assembly       |  |                    |  | result (measured)                               |                                    |
| spray tank            | over volume                            |                    |  | 6.9 %   | * min. 5 %                         |
|                       | contents gauge                         | graduation marks   |  | electronic device, 1 l steps                    | * max. 100 l                       |
|                       |  |                    | deviation                                    | 2.3 %   | * max. 7.5 % up to 1000 l filling  |
|                       |  |                    |  | -1.2 %  | * max. 5 % between 1000 and 5000 l |
|                       | surface roughness                      |                    |  | 0.056 mm  | * max 0.1 mm                       |
| rinsing tank          | volume                                 |                    |  | 523 l corresponding to 10.5 % of nominal volume | * min. 10 % of nominal contents    |
|                       | rinsing and dilution possible?         |                    |  | yes   |                                    |
| can rinsing equipment | rinsing efficiency                     |                    |  |   | * max. 0.01 % of can contents      |
| manometer             | graduation marks                       |                    |  | 0.1 bar (electronic device)                     | * max. 0.2 bar                     |
|                       | deviation                              |                    |  | 0.05 bar  | * max. 0.2 bar                     |
| agitation system      | deviation from even concentration      |                    |  | 12.9  | * max. 15 %                        |
| residual in l         | dilutable                              |                    |  | 68.7 l  | * max. 97 l                        |
|                       | non delutable                          |                    |  | 0 l   |                                    |
| spray boom            | height adjustment range from - to      |                    |  | 480 mm - 2840 mm                                |                                    |
|                       | nozzle ground contact protection       |                    |  | yes   |                                    |
|                       | nozzle at 3 bar pressure               |                    |  | 0 % (with IDN 120 03 POM)                       | * max. 10 %                        |
|                       | nozzle dripping after switch off       |                    |  | 0 ml  | * max. 2 ml                        |
|                       | single nozzle flow rate                |                    |  |   |                                    |
|                       | type of nozzle: Lechler IDN 120 03 POM |                    |  |   |                                    |
|                       | pressure (bar)                         | flow rate (l/min)  | max. deviation from table in % * (max. 10 %) | max. deviation from mean in % * (max. 5 %)      |                                    |
|                       | 3.0                                    | 1.165              | 4.87   | 3.8   |                                    |
|                       | 5.0                                    | 1.487              | 4.90   | 2.35  |                                    |
|                       | transverse distribution                |                    |  |   |                                    |
|                       | type of nozzle: Lechler IDN 120 03 POM |                    |  |   |                                    |
|                       | pressure (bar)                         | nozzle height (cm) | coefficient of variation (%) * (max. 9 %)    |   |                                    |
|                       | 3.0                                    | 50                 | 3.6  |   |                                    |
|                       | 5.0                                    | 50                 | 3.7  |   |                                    |
|                       | 8.0                                    | 50                 | 4.0  |   |                                    |

Fig.10: Result table 1.

| Result table                     |  |                              |   |              |
|----------------------------------|--|------------------------------|---|--------------|
| volume/hectare adjustment device |  |                              |   |              |
| repeatability of adjustment      |  |                              |   |              |
|                                  |  | adjusted flow rate in l/ha   | deviation from adjusted value %<br>* (max. 6 %) | CV * (< 3 %) |
|                                  |  | 214                          | -1.0  | 0.46         |
|                                  |  | 302                          | 1.0   | 0.48         |
|                                  |  | 389                          | -1.4  | 0.68         |
| procedure                        |  |                              | % to adjusted value                             |              |
|                                  |  | switching on / off           | 2.1   | * max. 7 s   |
|                                  |  | switching of single sections | 1.8   | * max. 7 s   |
|                                  |  | changing gears               |   |              |
|                                  |  | 1.5 m/s to 2.0 m/s           | 1.5   | * max. 7 s   |
|                                  |  | 2.0 m/s to 2.5 m/s           | 1.0   | * max. 7 s   |
|                                  |  | 2.5 m/s to 2.0 m/s           | 2.0   | * max. 7 s   |

Fig.11: Result table 2.



Explanation on testing:

Testing takes place according to the Technical Instructions for ENTAM-Tests of Field Crop Sprayers (Rel.4). This procedure was developed by the competent testing authorities of the European countries participating in ENTAM and is based on the CEN standard EN 12761 „Agricultural and forestry machinery – Plant protection equipment for the application of plant protection products and liquid fertilisers“. This test is only a technical performance test which takes place without an accompanying field test. The test results apply only to the tested appurtenances of the sprayer. Statements on the behaviour of the sprayer with different appurtenances cannot be derived from these results.

## Responsibility and recognition



### Performing competent authority:

Julius Kühn-Institute (Germany)  
 Institute for Application Techniques in Plant Protection  
 Messeweg 11-12  
 D-38104 Braunschweig

### This test is recognized by the ENTAM members:



**BLT** - Francisco Josephinum, Wieselburg (Austria) 050/11



**AU/DAE** - University of Aarhus - Department of Agricultural Engineering Sciences (Denmark) AU/DAE/ENTAM 2011-17



**Cemagref** - Institut de recherche pour l'ingénierie de l'agriculture et de l'environnement (France) CEMAGREF/ENT/11/039



**HIAE** Hungarian Institute of Agricultural Engineering (Hungary) D-57/2011



**ENAMA** Ente Nazionale per la Meccanizzazione Agricola (Italy) ENTAM „Rapporto di prova prestazionale“ 11/2011



**PIMR** - Przemyslowy Instytut Maszyn Rolniczych Industrial Institute of Agricultural Engineering (Poland) PIMR - 77/ENTAM/11



**CMA** Generalitat de Catalunya Centre de Mecanització Agrària (CMA) (Spain) EPH 006/11



**I.A.M.C.** Institute of Agricultural Machinery and Constructions (Greece) ΛΕ/153/01/ΖΖ