

ENTAM - Test Report



Sprayer type: Trailed field crop sprayer
Trade mark: CHD Eefting
Model: FG 7333

Manufacturer:
CHD Eefting B.V.
Ruiten A Kanaal Noord 6
NL-9561 TE Ter Apel

Test report: D - 2255
July 2022

Assessment table

Table 1: Assessment table

Number	Contents	Assessment
1	spray tank surface roughness	+++
2	spray tank over volume	++
3	volume of total residual	++
4	spray tank contents gauge up to 10% filling	+
5	spray tank contents gauge from 10% to 20% filling	+
6	spray tank contents gauge from 20% filling	++
7	effectivity of agitation system	+
8	width of nozzle bar section	+++
9	boom height adjustment range	+++
10	accuracy of pressure gauge	++
11	accuracy of flow meter, see no.15	
12	regulation speed	++
13	even transverse distribution	+
14	size of rinsing water tank	+
15	deviation of volume/hectare adjustment device from desired value	+
16	repeatability of volume/hectare adjustment device	+++
17	pressure drop between manometer and nozzle	++
18	deviation of single nozzle output from table	++

Assessment keys are listed at the end of the report.

Note:

This ENTAM report is prepared as an accessible document.

Technical data of sprayer

Tanks + pumps:

- 7300 liter tank
- electronic level indicator
- 4x rotating nozzles für inner tank cleaning
- 750 liter rinsing water tank
- 14,9 liter hand wash tank
- 2x AR 280 BP piston diaphragm pumps as spray and agitator pumps

Spray boom:

- 33 meter working width, 7 mechanical segments
- Lateral folding
- Lifting mast with stepless adjustment from 310 - 2800 mm
- 6 ° pendulum device
- Slope compensation up to 9 %
- Pressure circulation system
- ingle nozzle circuit with 3 compartment nozzle carriers

Frame + chassis + drive:

- 770 mm ground clearance axle and 410 mm drawbar with 520/85 R46 tyres
- track width 2250 mm

Dimensions + weights:

- Total length 8400 mm
- Height 3880 mm
- Width 2940 mm
- Unloaded weight 7980 kg
- Total weight 14000 kg

When the machine is completely filled, it exceeds the technically maximum permissible total weight!

Description of sprayer

In this test, the CHD FG 7333 sprayer was tested with two PTO driven Hypro Piston diaphragm pumps AR 280 BP.

The chassis consists of two load-bearing steel profiles, which are supported by a hydropneumatically suspended axle and a drawbar with bottom hitch. The track width is 2250 mm. The field sprayer is steered with a steering knuckle to follow the tractor track.

The spray liquid tank, made of glass fibre reinforced plastic, has a nominal volume of 7300 l and can be overfilled by up to 9.9 %. The fill level is recorded electronically and displayed in the terminals, in the tractor and operating centre on the sprayer. The tank is emptied via an electrically switched ball valve located in the suction line installed in the tank sump. The tank is filled via the 3" Camlock suction connection on the left side of the unit using the two unit pumps. Another filling option is the Storz C hydrant connection, which is also located on the left side of the unit. The operation of the liquid feed is fully electric and is controlled via the Tank-Control II or the terminal in the tractor cab. For cleaning the tank, four rotating cleaning nozzles are centrally located between the baffles in the tank, which are supplied by the agitator pump. The tank has 2 agitators, the normal and intensive agitator. The intensive agitator is fed by the agitator pump.

The spray boom is a ladder construction made of steel profiles and is guided in a lifting carriage. The boom is hydraulically folded to the side. The height adjustment is infinitely variable hydraulically via the lifting carriage from 310 to 2800 mm. The pendulum range is up to 6° against the horizontal. The tested device was also equipped with slope compensation, which can compensate for slopes of up to 9 %. Four ultrasonic distance sensors take over the height guidance of the boom, whereby the boom is automatically raised and lowered when it is extended and reinserted at the headland. The desired distances between the nozzles and the target level can be specified by the user. The boom is mechanically divided into a total of seven segments. The nozzles are protected from contact with the ground or branches in the outer segment by a circumferential tube and perforated plate.

The pneumatic swing-out induction bowl made of polyethylene is equipped with a hinged lid. The height of the filling opening is approx. 840 mm. The functions of the induction hopper are operated via three spring-loaded toggle levers in the operating centre above the induction hopper.

The field sprayer has a control unit with job computer (ISOBUS) and terminal Müller "Touch 800" for speed-dependent control of the application with track driving assistant and automatic part-width section control (GNSS sensor). All spraying, GNSS, steering, operation and job management relevant data are displayed, selected and set via the terminal.

Result table

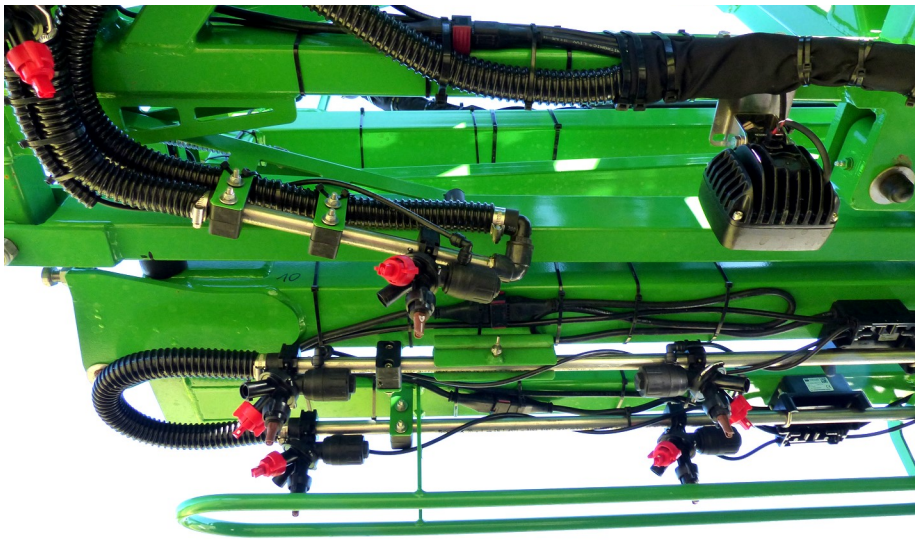
Table 2: Result table

Requirement	Result
spray tank over volume	9.90 %
spray tank contents gauge graduation marks	electronical display
spray tank contents gauge deviation between 10 - 20 % tank filling	7.48 %
spray tank contents gauge deviation over 20 % tank filling	3.25 %
spray tank surface roughness	0.007 mm
rinsing tank volume	750 liter
rinsing and dilution possible?	yes
cleaning performance of tank (cleaning effectivity)	83.85 %
rinsing efficiency of can rinsing equipment	0.0010 %
manometer graduation marks	0.10 bar
manometer deviation	0.10 bar
agitation system performance (deviation from even concentration)	14.99 %
dilutable residual in spray tank	81.37 liter
non dilutable residual in spray tank	non
spray boom height adjustment range from - to	310 - 2800 mm
spray boom nozzle ground contact protection?	yes
spray boom pressure loss between manometer and nozzle at 5.0 bar	5.0 %
spray nozzles dripping after switch off	non
maximum deviation of single nozzle flow rate from table	- 4.6 %
maximum deviation of single nozzle flow rate from mean	- 2.8 %
spray boom transverse distribution with nozzle: Lechler IDN 120-04	
transverse distribution at 50 cm and 1 bar	5.29 % CV
transverse distribution at 40 cm and 3 bar	7.05 % CV
transverse distribution at 50 cm and 5 bar	3.63 % CV
volume/hectare adjustment device - spray computer	
spray computer repeatability of adjustment deviation, ascending maximum	0.40 %
spray computer repeatability of adjustment deviation, descending maximum	0.69 %
spray computer regulation speed, switching on/off single sections	2.20 seconds
spray computer regulation speed, switching on/off complete sprayer	2.20 seconds
spray computer reaching steady state in varying conditions, changing gear	4.4 seconds

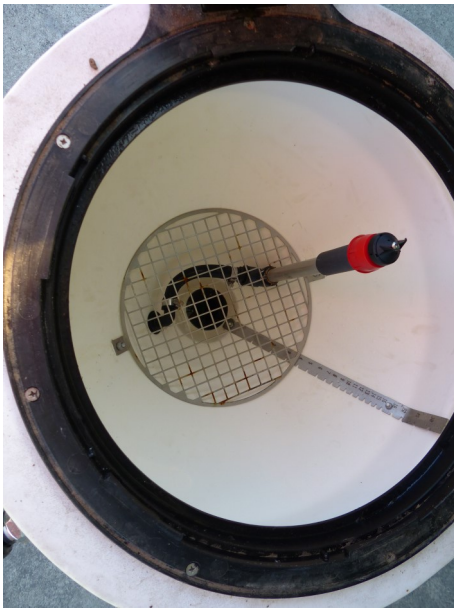
Explanation on testing:

Testing takes place according to the Technical Instructions for ENTAM-Tests of Field Crop Sprayers (Rel.5). This procedure was developed by the competent testing authorities of the European countries participating in ENTAM and is based on the standard EN ISO 16119. 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.

Pictures of sprayer



Pictures of sprayer



Assessment keys for assessment table

Table 3: Assessment keys for table 1 Assessment table

assessment point	unit	+	++	+++
1	mm	> 0.070 - 0.1	0.030 - 0.070	< 0.030
2	%	5 - 8	> 8 - 12	> 12
3	of allowed value	> 2/3	1/3 - 2/3	< 1/3
4	%	15.0 - 10.0	10.0 - 5.0	< 5.0
5	%	7.5 - 5.0	< 5.0 - 2.5	< 2.5
6	%	5.0 - 4.0	< 4.0 - 2.0	< 2.0
7	%	> 10 - 15	5 - 10	< 5
8	m	4.5 - 6	> 3 - 4.5	3 or less
9	m	1 - 1.5	> 1.5 - 2.0	> 2.0
10	bar	> 0.10 - 0.20	> 0.05 - 0.10	0.00 - 0.05
11	%	4 - 5	2 - 4	0 - < 2
12	% or seconds	> 7 - 7.5	> 3 - 7	0 - 3
13	CV	> 7 - 9	4 - 7	< 4
14	% of nominal tank volume	10 - 12	> 12 - 15	> 15
15	s	> 4 - 7	2 - 4	< 2
16	deviation %	> 4 - 6	2 - 4	< 2
17	%	> 7 - 10	3 - 7	< 3
18	%	> 7 - 10	3 - 7	< 3

Pictures:

Page 6, top: Left side of the sprayer.

Page 6, middle: Folded boom with nozzels.

Page 6, bottom: Control centre and filling connections on the left side of the sprayer.

Page 7, top: Control center and induction bowl at the left sprayer side.

Page 7, middle: PTO driven centrifugal pump.

Page 7, bottom: Lifting mast with boom.

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Responsibility and recognition



Performing competent authority
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This test is recognized by the ENTAM members



CMA-Administració de la Generalitat de Catalunya, Centre de Mecanització Agrària (Spain).
 Recognition number EPH03/22



ENAMA Ente Nazionale per la Meccanizzazione (Italy). Recognition number ENTAM
 „Rapporto di prova prestazionale” 02/2022



INRAE - Institut National De Recherche en Agriculture, Alimentation et Environnement (France).
 Recognition number INRAE/CEMAGREF/ENTAM/22/011



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