

## ***ENTAM - Test Report***



**Sprayer type:**  
**Trade mark:**  
**Model:**

**Trailed field crop sprayer**  
**Amazone**  
**UX 5200 Super**

**Manufacturer:**  
Amazonen-Werke H. Dreyer  
Am Amazonenwerk 9 - 13  
49205 Hasbergen-Gaste  
Germany

**Test report: D - 2059**

August 2016

Assessment table		
No.	Contents	Assessment
1	Spray tank surface roughness	++
2	Spray tank over volume	++
3	Volume of total residual (here max. allowed 86 l)	++
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	see no.14
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.

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	%	>7-10	>3-7	0-3
3	of al-low.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	times amount of dilutable	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	CV	>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.julius-kuehn.de](http://www.julius-kuehn.de)

## Technical data of sprayer

- 22.5 l washhand Tank.

- 5200 l tank.  
- Filling via hose connector by spray pump.  
- Spray computer: "AMATRON 3" with ISOBUS.  
- 526 l rinsing water tank.

- 30 m working width.  
- 11 hydraulic sections.  
- Infinitely variable from 500mm—2560mm.  
- Boom pendulum with 8° range.  
- Slope compensation up to 15 %.  
- Recirculation system „DUS“ for spray liquid.



- Two 6 chamber membran pumps.  
Type „AR 280 bp“ with 264 l/min.  
at 20 bar.

- 2.0 m track width.  
- 740 mm ground clearance  
(drawbar) with 520/85R42 tyre size.  
- Rigit drawbar with PU dampers.  
- Pivot steering.

### Dimensions and weights :

total length:	7500 mm
height:	3480 mm
width:	2650 mm
unloaded weight:	3980 kg

Fig.3: Overview.



## Description of sprayer



Fig.4: Left sprayer side with contents indicator, induction bowl and new designed control panel and pumps (on the drawbar in the background).

The framework is made of steel profiles, with the tank situated on the top. The non suspended axle was adjusted to a track width of 2.0 m. The suspended drawbar is equipped with PU dampers to reduce the jolts from towing. The framework is designed for a maximum speed of 40 km/h. The pumps (AR280 bp, one for spraying, one for

agitation) are placed on top of the drawbar, they are driven by power take-off shaft. The spray tank is designed without splash walls and only a small part of its base is flat due to its slim shape walls and sloping sides. The tank, with an oversize of 10.9 %, has sufficient reserves to accommodate any foam which may result. Two connected clean water tanks with a volume of together 526 l are mounted on the left and right sprayer side, for inner tank cleaning or for rinsing of the liquid system. Also for washing the outer surfaces of the sprayer the clean water tanks can be used. In this case they will be connected with a hose drum with spray lance at the stern of the sprayer.

The separate hand wash tank holds 22.5 l. The pressurised agitation system can be switched off to keep the residues in the tank to a minimum. In case of less than 200 l in the main tank, the agitation system is shut down automatically. The speed of the agitation system can also be infinitely adjusted by a valve. The sprayer is equipped with a level indicator based on float gauge.

The boom is a framework construction made of steel profiles whose height can be adjusted hydraulically and infinitely by a parallelogram.



Fig.5/6: Mounting of the drawbar and shock absorbing PU-dampers.

## Description of sprayer



Fig.7: The new designed control panel at the left sprayer side shall avoid operating errors.

It comprises a central pendulum with a pendulum range of up to  $8^\circ$  and hydraulic incline adjustment up to an incline of 15 %. It is also possible to work with the outer boom sections stay folded. The sprayer is equipped with a pressurized fluid circulation system (DUS) which assures that the full spray concentration is available for all nozzles right at the beginning of the spray. Also the fluid conducting parts of the boom can be rinsed independently. The circulation

system works with a fixed liquid pressure in the pipes but it can also be completely switched off. Thanks to this (overpressure) recirculation system the amount of non delutable residual can be reduced to about 1.5 l. The spray level reading is possible manually (on the left sprayer side) or on the display. The level reading on the left sprayer side is sufficient for levels above 1000 l.

By using the tank filling connection the tank can easily be filled with both pumps.

The plant protection product can be flushed into the tank by using the induction bowl on the left sprayer side. For using the bowl, it has to be tilt out. For flushing in and for rinsing the bowl it is equipped with a circular pipe and 3 fixed nozzles. For the rinsing of plant protection containers an additional rotating nozzle is mounted in the bowl. In the current tested version the bowl is equipped with a contents indicator made of plastic which makes it easy to read the contents.



Fig.8: Improved induction bowl with contents indicator.



## Description of sprayer



Fig.9: Spray computer and terminal "AMATRON 3".

The most important functions for filling and agitating are centralised on the operator control board on the left side of the sprayer.

In normal spraying mode the speed and current application rate or the liquid flow in l/min are shown on the display of the spray computer terminal „AMATRON 3“. Also other information like sprayed amount of liquid or sprayed area can be displayed there.

<b>Result table</b>
---------------------

tested assembly				result (measured)		
spray tank	over volume			10.9 %	* min. 5 %	
	contents gauge		graduation marks	electronical display	* max. 100 l	
			deviation	-7.2%	* max. 7.5 % up to 1040 l filling	
				-1.6%	* max. 5 % between 1040 l and	
	surface roughness			0.052 mm	* max 0.1 mm	
rinsing tank	volume			526 l	* 10 times delutable residual on	
	rinsing and dilution possible?			yes		
	Cleaning performance (main tank) (concentration after cleaning)			2650	Min.factor 400 of concentration before cleaning	
can rinsing equipment		rinsing efficiency		0.01 %	* max. 0.01 %	
manometer	graduation			0.1 bar		
	deviation			0.2 bar	* max. 0.2 bar	
agitation system	deviation from even concentration			4.7 %	*max. 15 %	
residual in l			dilutable	50.5 l	* max. 86 l	
			non dilutable	1.5 l		
spray boom	height adjustment range from - to			500 mm - 2560 mm		
	nozzle ground contact protection			yes		
	pressure loss between manometer			1.0 % (with AGR TD High	* max. 10 %	
	nozzle dripping after switch off			0 ml	* max. 2 ml	
	single nozzle flow rate					
	type of nozzle: AGR TD High Speed 04					
		pres- sure (bar)	flow rate (l/ min)	max. deviation from table in % *(max. 10 %)	max. deviation from mean in % *(max. 5 %)	
		4.0	1.837	-5.0	-4.3	
	transverse distribution					
		type of nozzle: AGR TD High Speed 04				
		pres- sure	distance (cm)	coefficient of variation (%) *(max. 9 %)		
		2.0	50	8.83		
		4.0	50	4.94		
		6.0	50	5.51		

Fig.10: Result table 1.

Result table			
volume/hectare adjustment device			
repeatability of adjustment			
adjusted flow rate in l/ha		deviation from desired value % CV (max. 3 % CV)	deviation from desired value % CV (max. 3 % CV)
		ascending application rate	Descending application rate
160		-3.25	0.26
240		-0.97	0.36
320		-0.98	0.36
procedure		regulation speed: deviation to adjusted value after 7 s	
switching on / off		3.6 %	after 7 s
switching of single sections		3.6 %	after 7 s
procedure		reaching steady state after varying conditions (s)	
change of driving speed by changing gears			steady state mean deviation
1.5 m/s to 2.0 m/s		1.8 s	< 10 %
2.0 m/s to 2.5 m/s		1.7 s	< 10 %
2.5 m/s to 2.0 m/s		5.1 s	< 10 %
2.0 m/s to 1.5 m/s		5.0 s	< 10 %

Fig.11: Result table 2.

#### 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.



## 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:



**HBLFA** Francisco Josephinum 019/2016  
**BLT** Wieselburg  
 (Austria)



**CMA** Generalitat de Catalunya EPH 06/16  
 Centre de Mecanització Agrària (CMA)  
 (Spain)



**ENAMA** Ente Nazionale per la Meccanizzazione Agricola ENTAM „Rapporto di prova prestazionale”  
 (Italy) 06/2016



**HIAE** (MGI) Hungarian Institute of Agricultural Engineering D-124/2016  
 (Hungary)



**IRSTEA** - National Research Institute of Science and Technology for Environment and Agriculture IRSTEA/CEMAGREF/ENTAM/  
 (France) (formerly CEMAGREF) 16/011



**PIMR** - Przemyslowy Instytut Maszyn Rolniczych Industrial Institute of Agricultural Engineering PIMR-139/ENTAM/16  
 (Poland)