

ENTAM - Test Report



Sprayer type:

Trailed Air assisted sprayer

Trade mark:

Lochmann

Model:

RPS 15/80 UQ; RPS 15/80 Q;
RPS 15/90 Q

Manufacturer:

Lochmann Plantatec GmbH-Srl

Vilpianer Straße 42

39010 Nals (BZ)

ITALY

July 2009

Test report: D - 1797

Assessment table

No.	Contents	Assessment		
		RPS 15/ 80 Q	RPS 15/ 80 UQ	RPS 15/ 90 Q
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	Pressure drop between manometer and nozzle	++	+	+
8	Deviation of single nozzle output from table	++	++	++
9	Accuracy of pressure gauge	+	+	+
10	Liquid flow rate left/right	+++	+++	+++
11	Rinsing water tank *	+	+	+

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

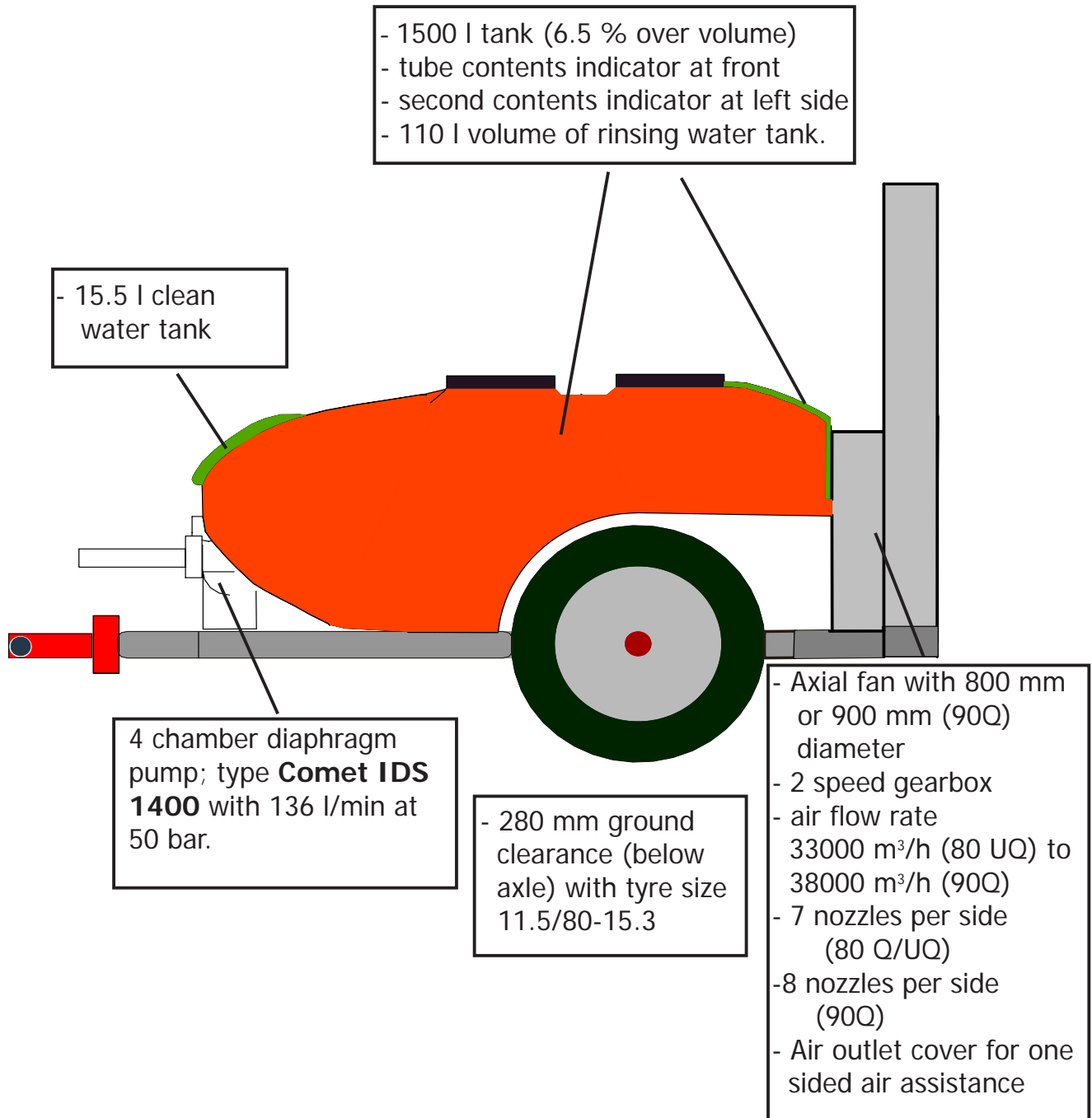
Note: The assessment keys are listed below. The detailed results are in the following test report.

No.	unit	+	++	+++	No.	unit	+	++	+++
1	µm	>70-100	30-70	<30	10	%	5.0-4.0	<4.0-2.0	<2.0
2	%	5-8	>8-12	>12	11	multiple of residual	10-12	>12-14	>14
3	of allow. value	>2/3-3/3	1/3-2/3	<1/3					
4	%	7.5-5.0	5.0-2.5	<2.5					
5	%	5.0-4.0	<4.0-2.0	<2.0					
6	%	>10-15	5-10	<5					
7	%	>7-10	3-7	<3					
8	%	>7-10	3-7	<3					
9	bar	>0.10-0.20	>0.05-0.10	0.00-0.05					

*) The rinsing water tank capacity was assessed according to the requirement of 10 times the dilutable residual of the main tank, measured according ISO 13440 with the sprayer in horizontal position.

Free download of the test under: www.ENTAM.com or www.jki.bund.de
--

Technical data of sprayer



Dimensions and weights (with 80 UQ):

total length:	3670 mm
height:	2060 mm
width:	1340 mm
unloaded weight:	736 kg

Fig.3: Diagram of sprayer Lochmann RPS 15/80 UQ

Description of sprayer

Uniaxial chassis made of steel (hot-dip galvanised) with articulated drawbar for towing via lower links. Pin diameter 22 mm (Cat. I)

The rigid axle has a tread of 1040 mm. The minimum ground clearance (under the axle) is 280 mm.

The sprayer is equipped with a 1500 l spray tank made of polyethylene with two direct scales at the front on the right (read via level indicator tube, volume marks up to 1500 l, scale gradations of 50 l) and on the left of the sprayer in the direction of travel (level indicator tube, volume markings from 150 l to 1500 l, scale gradations of 50 l). With an oversize of 6.5 %, the tank has sufficient room for any foam which may occur. The tank can be emptied using a protected valve (brass slide valve) on the left side of the sprayer. The inside of the spray tank is cleaned by two rotating cleaning nozzle (brass) which are situated at the front and rear wall of the tank. The sprayer has a combined pressure and return agitator. The pressure agitator, which can be switched off, consists of a stainless steel tube with bore holes. The tube is situated in driving direction on the right side above the tank bottom with the holes geared to spread the liquid horizontal to the left tank side.



Fig.4: Front side with draw bar, pump, suction filter and front tank contents indicator

Description of sprayer

The rinsing water tank holds 110 l. It is filled using a filling hole on the top and rear side of the main tank. The main tank filling hole has a diameter of 405 mm. The pump and pipes can also be rinsed when the spray tank is full. The tank rinsing system, induction filter and pressurised agitator can be switched on and off by separate ball valves at the distributor. There is a 15.5 l clean water tank made of polyethylene with a separate tap for the operator to wash himself.

The electric driven valves are manually operated at the control panel which can be located in the tractor cabin. It consists of a central switch for shutting off both spray sections (left and right), spray section valves for opening the left or the right spray section, a pressure regulation device (pressure variation by switches) and a pressure gauge, 63 mm in diameter (WIKA). The return from the pressure regulation device can be switched by a valve so that it flows either into the tank or into the suction pipe leading to the pump. A spray gun and a sprayer washing system can be connected to the free outlet at the pump (ball valve).

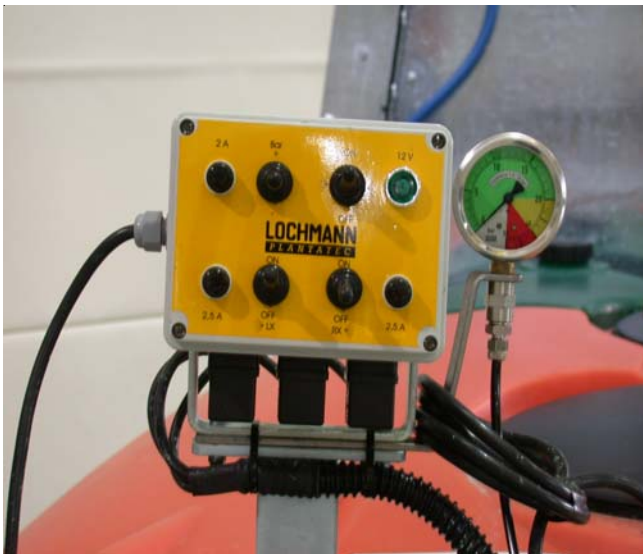


Fig.5: Manually operated control valves

Description of sprayer

The tested fans are axial flow fans with rotor diameters of 800 mm (80 Q, 80 UQ) and 900 mm (90 Q) the fan unit is made of galvanised sheet steel. The upper and lower air flow limits can be set using the deflectors. The fan casing is equipped with covers at both sides in order to suppress air assistance on one side if required. The air covers are made from galvanised steel or plastic. The position of the cover has to be adjusted by hand at the fan casing. The fan is driven by power take-off via



Fig.6: Axial fan „80 Q“ with 800 mm rotor and air intake from rear



Fig.7: Axial fan „80 UQ“ with 800 mm rotor and air intake at the front

a mechanical 2-speed gearing. The sprayer is equipped with double swivel nozzle bodies made of brass to which the nozzle ends are attached. The nozzles are positioned in front of the air exit in the direction of travel. The distance between the nozzles can be adjusted using elongated holes. Each spray nozzles can be switched off separately. With 82.6 dB (A) (80 UQ) up to 87.0dB (A) (80 Q) on speed II (measured when driving past at a distance of 7 metres) The fans are relatively quiet.

Description of sprayer

Depending on the type of fan the air flow rates at 540 rpm varies between 24679 m³/h (80 UQ), 25500 m³/h (80 Q) and 27500 m³/h (90 Q) for the low fan gear speed. In the fast fan gear speed the fans deliver air flow rates between 33000 m³/h (80 UQ), 35800 m³/h (80 Q) and 38000 m³/h (90 Q).

The air speed distribution between the right and left side of the fans (see Fig.9 - Fig.11) are nearly the same for both fan speeds only on different air velocity levels.



Fig.8: Axial fan „90 Q“ with 900 mm rotor

Result table

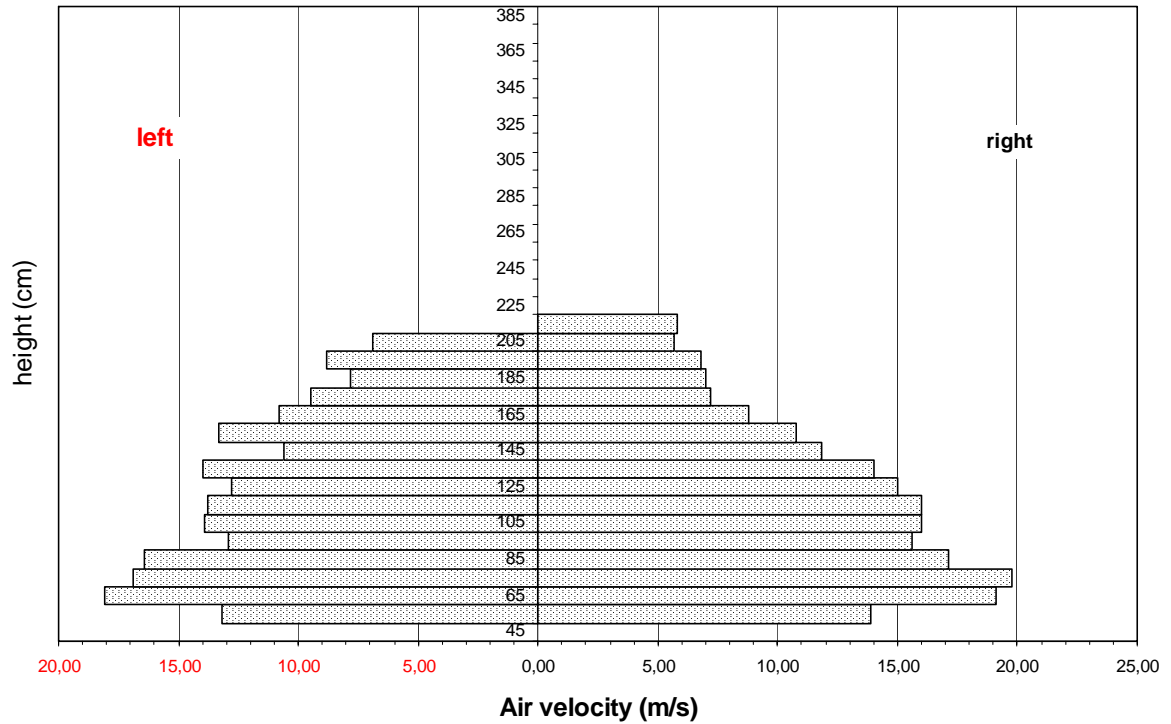


Fig.9: Air symmetry and velocity with 80 UQ (800 mm axial fan), low speed at 540 rpm

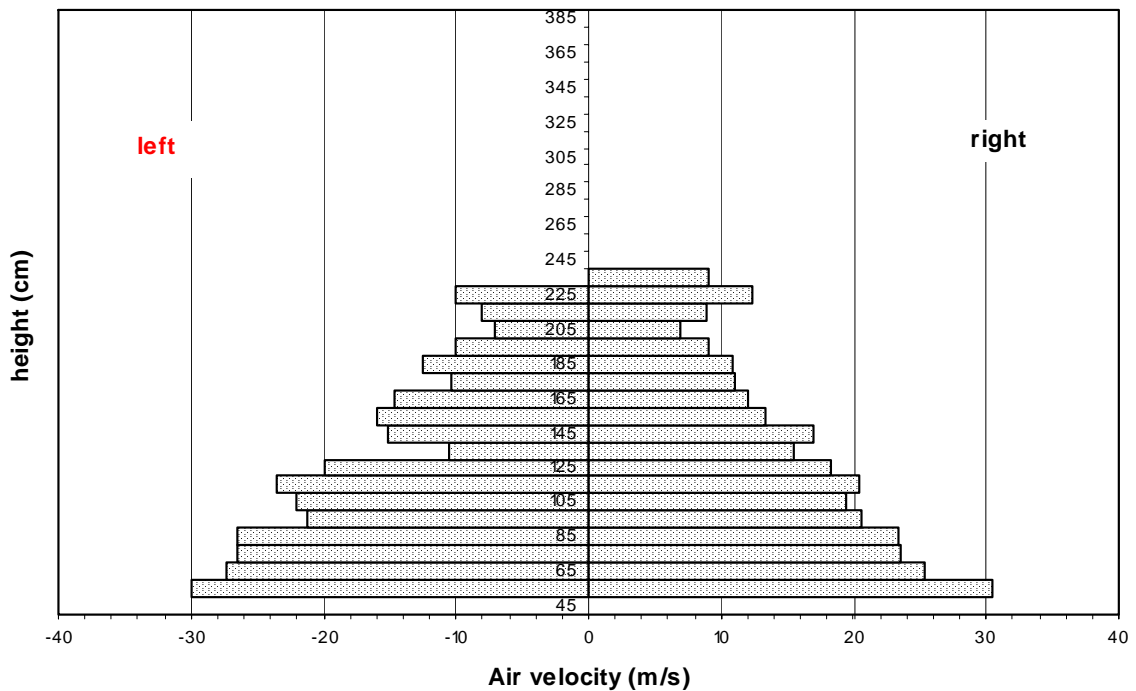


Fig.10: Air symmetry and velocity with 80 Q (800 mm axial fan), low speed at 540 rpm
(Note: negativ air velocity means direction to the left from travelling direction)

Result table

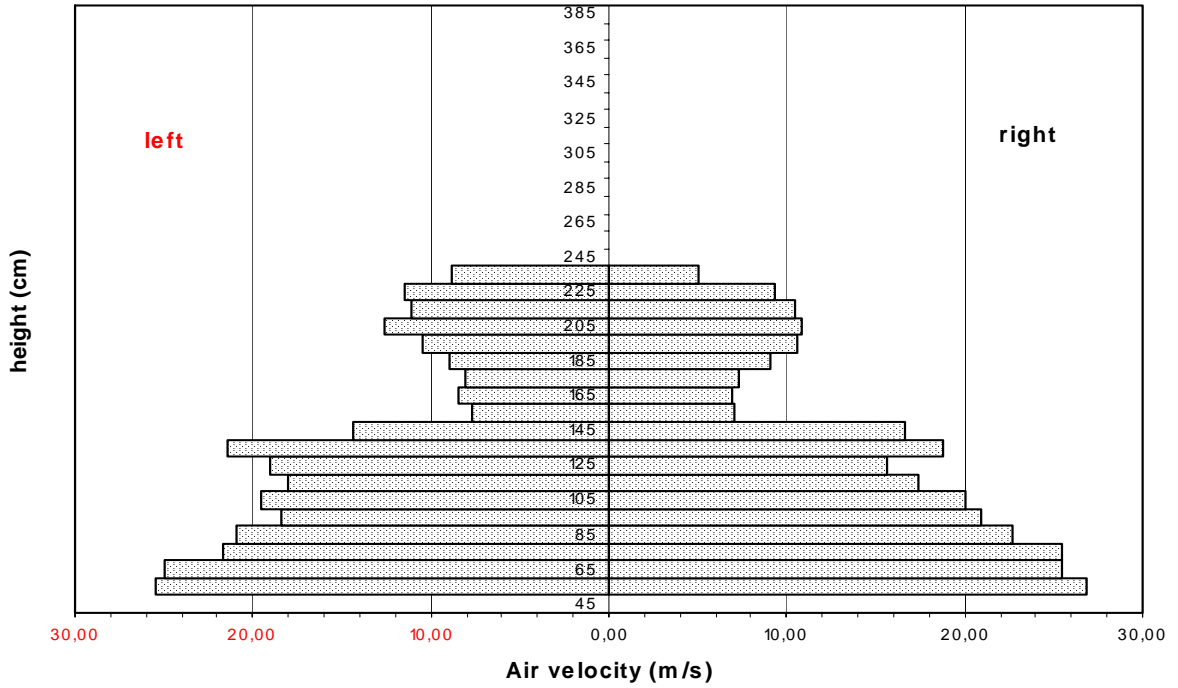


Fig.11: Air symmetry and velocity with 90 Q (900 mm axial fan), low speed at 540 rpm

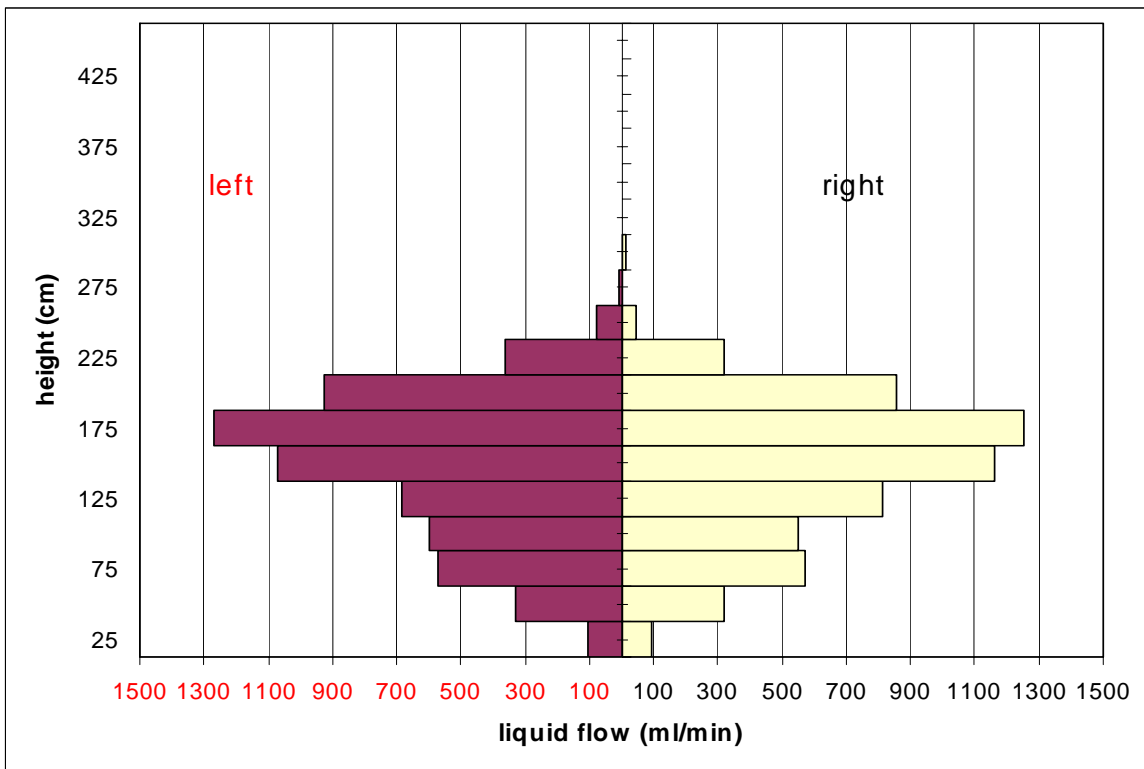


Fig.12: Liquid distribution 80 UQ with AVI 80-015 (8 bar), low speed, 150 cm distance from fan centre

Result table

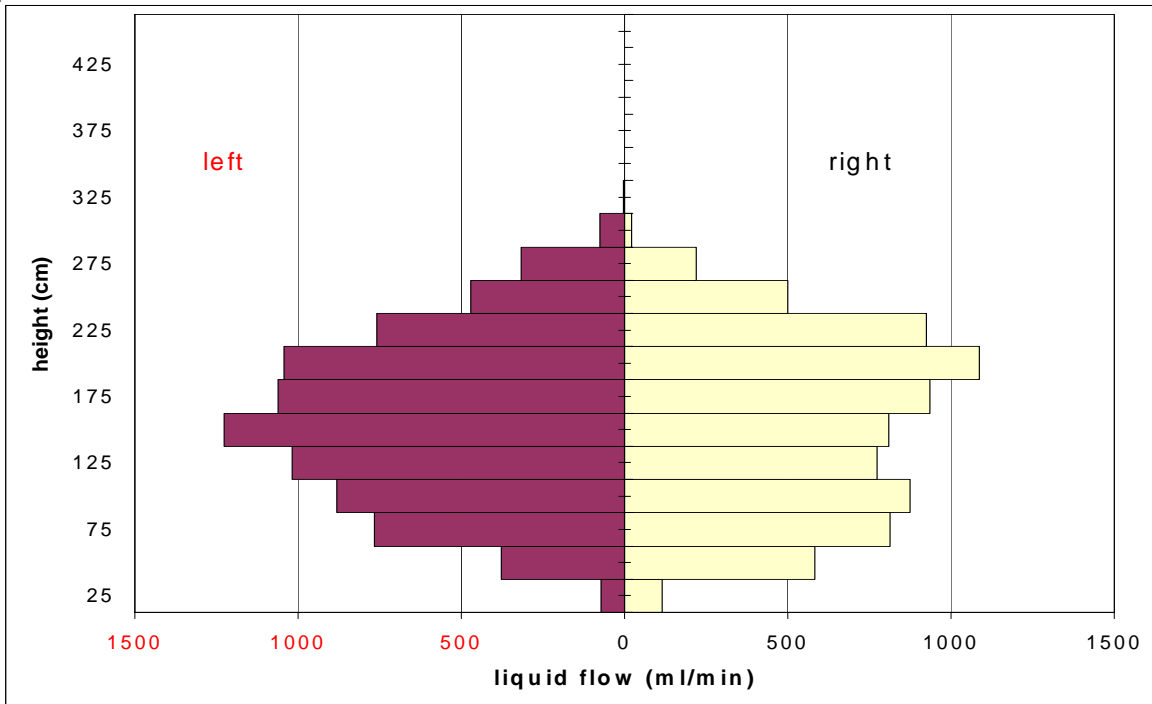


Fig.13: Liquid distribution 80 Q with AVI 80-02 (10 bar), low speed, 150 cm distance from fan centre

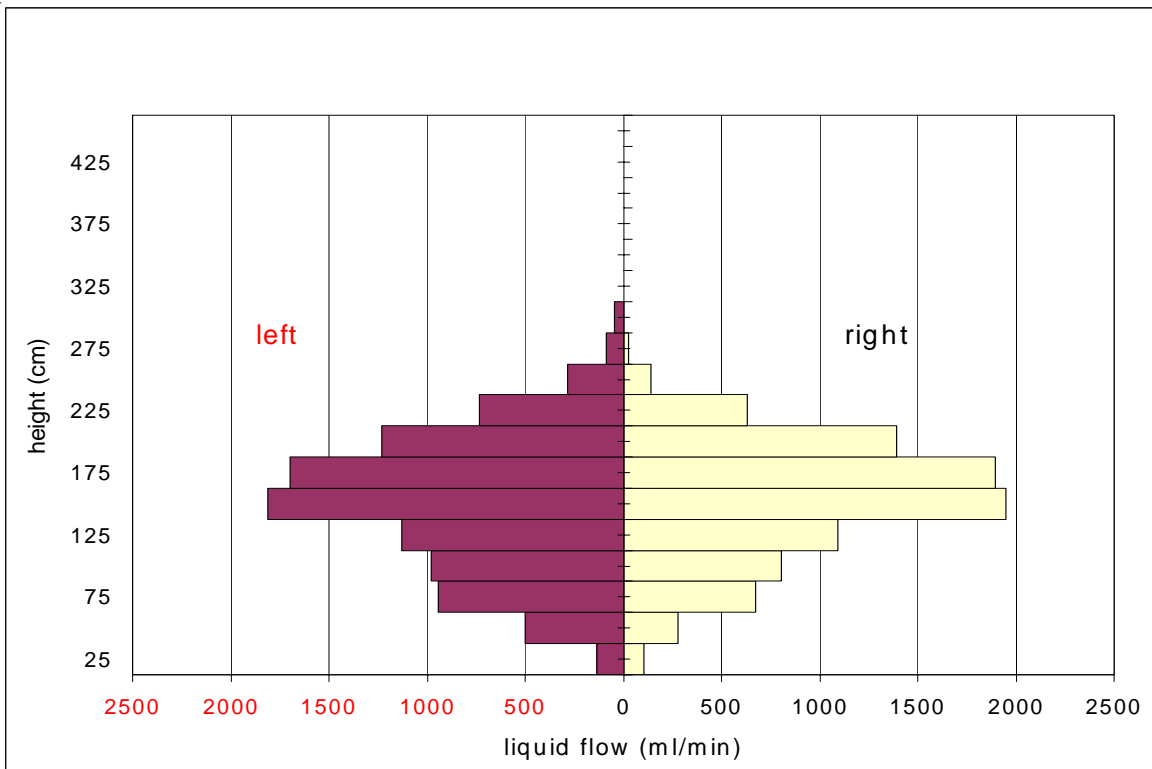


Fig.14: Liquid distribution 90 Q with AVI 80-02 (8 bar), low speed, 150 cm distance from fan centre

Result table

tested assembly		result (measured)	
spray tank	over volume	6.5%	* min. 5 %
	contents gauge graduation marks	50 l	* max. 100 l
	deviation	6.5 %	* max. 7.5 % up to 300 l filling
		3.9%	* max. 5 % between > 300 and 1500 l
surface roughness	0.037 mm	* max 0.1 mm	
rinsing tank	volume	110 l corresponding to 21 times the dilutable volume (horizontal)	* min. 10times the dilutable volume
	rinsing and dilution possible?	yes	
agitation system	deviation from even concentration	-13.6 %	*max. 15 %
	pressure drop manometer - nozzle	7.0 % (80 Q) to 8.6 (80 UQ)	* max. 10 %
	nozzle dripping after switch off	0 ml	* max. 2 ml
	deviation liquid flow rate left / right (10 bar) with AVI 80 02	0.49 % (80Q) - 1.72 % (90Q)	* max. 5 %

(*) allowed

Fig.15: Result table RPS 15

Safety Tests

The sprayer is equipped with safety pictograms (stickers) and operating instructions in the native language, which include further safety information. The sprayer carries a CE-mark and a vehicle identification plate.

The CE-mark shows that a product fulfills the requirements defined for the respective EC directives and that the supplier has carried out the appropriate procedures to achieve conformity. The CE-mark is placed on the equipment by the manufacturer. The manufacturer confirms by doing so that the sprayer was designed and built in accordance with harmonised EC Directive 2006/42/EC and that the standard EN ISO 4254-6 has been complied with.

Explanation on testing:

Testing takes place according to the Technical Instructions for ENTAM-Tests of air assisted sprayers (release 3). 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:



HIAE Hungarian Institute of Agricultural
 Engineering (Hungary)

D-33/2010



NAGREF National Agricultural Research
 Foundation (Greece)

ΔΕ/126/01/ΖΖ



ENAMA Ente Nazionale per la Meccanizzazione
 Agricola (Italy)

ENTAM „Rapporto di
 prova prestazionale“
 20/2010



CMA Generalitat de Catalunya
 Centre de Mecanització Agrària (CMA) (Spain)

EPHP 003/10



BLT- Francisco Josephinum, Wieselburg
 (Austria)

BLT-Prot.-Nr. 038/10



PIMR - Przemyslowy Instytut Maszyn Rolniczych
 Industrial Institute of Agricultural Engineering
 (Poland)

PIMR - 62/ENTAM/10



AU/DAE - University of Aarhus - Department of
 Agricultural Engineering Sciences (Denmark)

AU/DAE/ENTAM
 2010-12



ART - Agroscope Reckenholz-Taenikon
 (Switzerland)

D-05.10



Cemagref - Institut de recherche pour l'ingénierie
 de l'agriculture et de l'environnement (France)

CEMAGREF/ENTAM/10/012