

ENTAM - Test Report



Sprayer type:
Trade mark:
Model:

Trailed air assisted sprayer
Munckhof
105

Manufacturer:
Machinefabriek J.M. van den Munckhof B.V.
Venrayseweg 126c
5961-AJ Horst
The Netherlands

Test report: D - 2055

April 2017

Assessment table

No.	Contents	Assessment
1	Spray tank surface roughness	+++
2	Spray tank over volume	++
3	Volume of total residual (here max. allowed 30 l)	+
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	+
12	Deviation stated / measured air volume	+

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

*) changed requirement

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	% nominal tank volume	10-12	>12-14	>14
3	of al-low.value	>2/3-3/3	1/3-2/3	<1/3	12	%	8-10	5 - < 8	< 5
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					

Free download of the test under: www.ENTAM.net
or www.julius-kuehn.de

Technical data of sprayer

- 810 mm axial fan with deflector device.
- 2 speed gearbox, PTO shaft driven.
- Aluminium propeller.
- Hydraulic driven device for one side shut down of air support.
- 18 nozzle stations.

- 119 l Wash water tank.



Fig.1: Overview.

- Piston pump.
Type „Munckhof WM 70“
with 65 l/min at 10 bar.

- 1000 l polythylene tank.
- Tube contents indicators.
- Mechanical agitator with paddles.

Dimensions and weights :

total length:	4260mm
height:	2900 mm
width:	1380 mm
unloaded weight:	718 kg

Description of sprayer



Fig.2: 810mm axial fan with air deflector device.

The framework of the sprayer is made of steel profiles with the tank situated on the top. The overall width of the sprayer is 1380 mm. The sprayer is designed for a road speed of 25 km/h. The sprayer coupling is designed for the use with the tractor linkage drawbar.

The spray tank with a nominal volume of 1000 l is made of plastic (polyethelene) and is designed without splash walls. The tank keeps an overvolume of 8.1 % to hold back foam. The clean water tank for rinsing and diluting holds a volume of 119 l. The hand wash tank for the operator has a volume of 15 l.

The tank is equipped with a mechanical agitator with paddles.

For monitoring the spray pressure a pressure gauge with 100 mm diameter is mounted at the sprayer frame front end. The scaling of the gauge ends at 25 bar. The contents of the spray tank can be controlled by tube contents indicators on the left side and the front frame of the tank.



Fig.3: Front tube contents indicator.

Description of sprayer



Fig.4: Hydraulic driven air deflector shield to reduce drift by avoiding the air stream support for this side.

The axial fan is equipped with aluminium fan blades. An hydraulic driven air deflector shield, made from stainless steel can be used to cover the fan opening at one side to distribute the droplets on that sprayer side without air assistance. This is important to reduce drift while spraying at the border of the orchard. To adjust

the air speed better to the thickness and height of the leave wall, the fan drive has a 2 speed gearbox (with freewheel position).

For the switching of nozzles and adjusting of spray pressure the control panel can be mounted at the front of the sprayer or on the tractor within the reach of the operator.



Fig.5: Control panel for pressure adjustment and nozzle section switching.

Description of sprayer

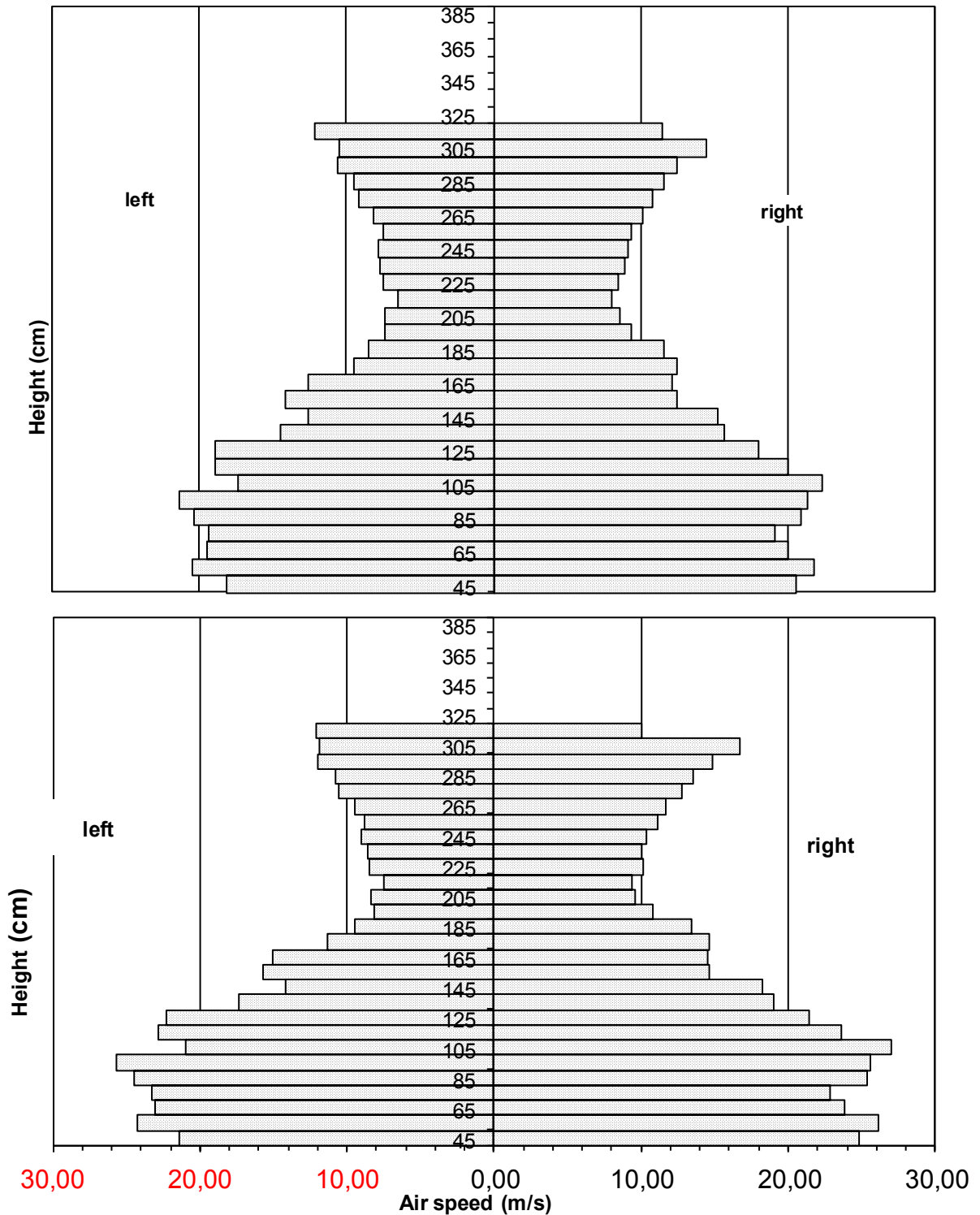


Fig.6: Air speed characteristic with air deflector device: slow gear (upper fig.); fast gear (lower fig.).
With 75 cm from centre and 540 1/min revolutions at PTO shaft.

Result table

tested assembly			result (measured)		
spray tank	over volume			8.1 %	* min. 5 %
	contents gauge		graduation marks	50	* max. 100 l
			deviation	2.4%	* max. 7.5 % between 100l and 200 l.
				3.6 %	* max. 5 % between 200 l and 1000 l
surface roughness			0.008 mm	* max 0.1 mm	
rinsing tank	volume			119 l	* 10 % of nominal tank volume
	rinsing and dilution possible?			yes	
	Cleaning performance (main tank) (concentration after cleaning)			2750	Min.factor 400 of concentration before cleaning
can rinsing equipment		rinsing efficiency			* max. 0.01 % of can contents
manometer	graduation marks			0.2 bar	* max. 0.2 bar
	deviation			-0.2bar	* max. 0.2 bar
agitation system	deviation from even concentration			8.8 %	*max. 15 %
residual in l		dilutable		27.8 l	* max. 30 l
		non dilutable		3.4 l	
pressure loss between manometer and nozzle at 10 bar pressure				-7.5 %	* max. 10 %
nozzle dripping after switch off				0 ml	* max. 2 ml
Deviation liquid flow rate left / right (10 bar) with Lechler ID90-02 C				0.6 %	*max. 5 %
Measured air volume (slow gear)				22500 m ³ /h	*max. 10 % deviation to stated value
Measured air volume (fast gear)				27200 m ³ /h	

Tab.3: Result table

* limit

Explanation on testing:

Testing takes place according to the Technical Instructions for ENTAM-Tests of Air Assisted 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 025/2017
BLT Wieselburg
 (Austria)



CMA Generalitat de Catalunya 02/17
 Centre de Mecanització Agrària (CMA)
 (Spain)



ENAMA Ente Nazionale per la Meccanizzazione ENTAM „Rapporto di Agricola
 (Italy) prova prestazionale“ 06/2017



HIAE (MGI) Hungarian Institute of Agricultural Engineering D-150/2017
 (Hungary)



IRSTEA - National Research Institute of Science and Technology for Environment and Agriculture IRSTEA/CEMAGREF/ENTAM/
 (France) (formerly CEMAGREF) 17/017



PIMR - Przemyslowy Instytut Maszyn Rolniczych Industrial Institute of Agricultural Engineering PIMR-165/ENTAM/17
 (Poland)