

ENTAM - Test Report



Sprayer type:
Trade mark:
Model:

Mounted field crop sprayer
Kverneland
iXter B18

Manufacturer:
Kverneland Group Nieuw-Vennep B.V.
Hoofdweg 1278
NL-2153 Nieuw-Vennep

Test report: D - 2073

Assessment table

No.	Contents	Assessment
1	Spray tank surface roughness	++
2	Spray tank over volume	++
3	Volume of total residual (here max. allowed 74 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	++

Tab.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	% of tank volume	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
or www.julius-kuehn.de

Technical data of sprayer

- 1800 l tank.
- Second contents indicator (electrical).
- Spray computer: ISO Match Tellus 60.
- 192 l rinsing water tank..
- 15.6 l hand wash tank.

- Pendulum range up to 15 °.
- Slope compensation up to 25 %.
- Boom height adjustment: continuously variable, height adjustment range: 1310 mm.



Fig.1: Overview.

- Diaphragm pump type: Altek P260 with 260 l/min

- 24 m working width.
- 4.5 m hydraulic section width.
- 7 mechanical sections.

Dimensions and weights :

total length:	1650 mm
height:	3220 mm
width:	2560 mm
unloaded weight:	1495 kg

Description of sprayer



Fig.2: Quick coupling frame with analog pressure gauge.

Chassis and boom are frame-work constructions made of steel profiles. The connection is realized by a quick coupling frame. That's how the sprayers centre of gravity can be close to the tractor and concurrent the PTO and hydraulic connectors are easily accessible. For parking the sprayer ex-

tensible rests are existing. The spray tank, with a nominal volume of 1800 l is made from PE, the design shows slim shape and sloping sides. This all helps to reduce residuals also if the sprayer is not standing in an upright position. By using the tank filling connection the tank can be filled with up to 260 l/min. For this the user has to use a device with check valve. Alternative it can also be filled via a connection for hydrants, that is equipped with a check valve. The tank, with an oversize of 11.5 %, has sufficient reserves to accommodate any foam which may result. To empty the tank, an electric valve on the left sprayer side can be used.



Fig.3: Contents indicator based on flush type fluid indicator.

Description of sprayer



Fig.4: Left sprayer side with control centre and pulled out induction bowl.

On the right sprayer side integrated is the rinsing water tank that holds 192 l.

The HC 24 boom is a framework construction made of steel profiles whose height can be adjusted hydraulically and infinitely with a lift frame. It comprises a central pendulum with a pendulum range of up to 15° and hydraulic incline adjustment up to an incline of 25 %. It is equipped with a damping and suspension system to reduce hits to the boom as well as vertical and horizontal movements of the boom. The working width of 24 m is splitted in 7 mechanical sections. Thanks to the design of the boom framework the nozzles are well protected against ground and obstacle contact. For road transportation the boom can be vertical folded to a width of 2.56 m. Also working with a one side folded boom or partly folded boom is

possible.

The liquid tubes on the boom are made from stainless steel and are equipped with multi nozzle holders. Also available is a “ENFO Inside” system. Such a system will open the different sections valves for a short time (depending of the dead volume of that section) to spray out the washing liquid (at the beginning of spraying) with low PPP concentration before the real spray mixture will reach the nozzles. So the real spray mixture is available at all nozzles from the beginning of spraying. At the end of spraying (after washing) it can work in the opposite direction to spray out the real spray mixture concentration until the washing liquid reaches the nozzles.

For loading the plant protection product, a retractable induction bowl can be used. This bowl is equipped with a circular pipe for flushing the plant protection product into the tank and for rinsing the induction bowl. For plant protection container rinsing a rotating nozzle is mounted in the bowl. Next to the induction bowl and the 15 l clean water tank for hand washing is installed.

Description of sprayer



Fig.5: „ISO Match Tellus 60“ terminal (ISOBUS) with switch board.

The liquid level in the tank is also displayed on the spray computer „ISO Match Tellus 60“ terminal and on the operators control board. The pressurized agitation system can be switched off via the computer to keep the residues in the tank to a minimum. The „ISO Match Tellus 60“ can also control the steering of all hydraulic and spray functions and is able to save the data like area and sprayed volume for some data sets. The „ISO Match Tellus 60“ records the driving speed, application rate, remaining distance or remaining liquid volume in the tank.

For manual operations the switch board can be used. It provides the functions for: folding and unfolding of the boom, switching of single sections, spaying ON/OFF, spray pressure, adjustment of boom height or inclination of the boom.

Result table

tested assembly				result (measured)		
spray tank	over volume			11.5 %	* min. 5 %	
	contents gauge		graduation	electronical display	* max. 100 l	
			deviation	3.1 %	* max. 7.5 % between 180l and 360 l	
				1.6 %	* max. 5 % bet- ween 360 l and 1800 l	
surface roughness			0.058 mm	* max 0.1 mm		
rinsing tank	volume			192 l	* 10 % of spray tank volume	
	rinsing and dilution possible?			yes		
	Cleaning performance (main tank) (reduction factor, concentration after			2109	Min.factor 400 of concentration	
can rinsing equipment		rinsing efficiency		0.0048 %	* max. 0.01 % of can contents	
manometer	graduation marks			0.2 bar	* max. 0.2 bar	
	deviation			0.05 bar	* max. 0.2 bar	
agitation	deviation from even concentration			13.9 %	*max. 15 %	
residual in l		dilutable		8.9 l	* max. 57 l	
		non dilutable		16.6 l		
spray boom	height adjustment range			1310 mm		
	nozzle ground contact protection			yes		
	pressure loss between manometer and nozzle at 3 bar pressure			8.70 % (with Lechler ID 120-04	* max. 10 %	
	nozzle dripping after switch off			0 ml	* max. 2 ml	
	single nozzle flow rate					
			type of nozzle: Lechler ID 120-04			
			pres- sure	flow rate (l/ min)	max. deviation from table in %	max. deviation from mean in % *(max.
			5.0	1.96	- 5.0	3.5
	transverse distribution					
			type of nozzle: Lechler ID 120-04			
		pres- sure (bar)	distance (cm)	coefficient of variation (%) *(max. 9 %)		
		1.0	50	6.6		
		5.0	50	3.0		
		8.0	50	4.0		

Tab.3: Result table

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
204	0	0.48
303	0.34	0.24
402	0.26	0.19
procedure	regulation time: time until deviation < 10 % to adjusted value	
switching on / off	4.5 s	max. 7 s
switching of single sections	3.0 s	max.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	2.1 s	< 10 %
2.0 m/s to 2.5 m/s	1.4 s	< 10 %
2.5 m/s to 2.0 m/s	2.0 s	< 10 %
2.0 m/s to 1.5 m/s	2.1 s	< 10 %

Tab.4: 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 021/2016
BLT Wieselburg
 (Austria)



CMA Generalitat de Catalunya 021/2016
 Centre de Mecanització Agrària (CMA)
 (Spain)



ENAMA Ente Nazionale per la Meccanizzazione 021/2016
 Agricola
 (Italy)



HIAE (MGI) Hungarian Institute of Agricultural 021/2016
 Engineering
 (Hungary)



IRSTEA - National Research Institute of Science and Technology for Environment and Agriculture 021/2016
 (France) (formerly CEMAGREF)



PIMR - Przemyslowy Instytut Maszyn Rolniczych Industrial Institute of Agricultural 021/2016
 Engineering
 (Poland)