



**Foundation of Quality Control of
Agricultural Machinery (SKL)**

Features for testing Air-assisted sprayers for bush and tree crops Already in Use.

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Preliminary remarks

The base for these features for testing air-assisted sprayers for bush and tree crops is in the "Regulation PT Use Application Equipment for Plant Protection Products 2004". In this regulation is the base for the obligation for testing air-assisted sprayers. This Features for testing air-assisted sprayers is used by the test operators of the SKL certified testing stations to test the air-assisted sprayers in a uniform way with using of the testing equipment as prescript in the "TCHNICAL REQUIREMENTS for the installation of a SKL testing station for testing air-assisted sprayers for bush and tree crops'. Only SKL approved testing stations are permitted to perform the tests. All tests have to done by test-operators who are in the possession of a certificate "SKL test-operator of air-assisted sprayers". The result of the tests has to written down on the SKL testing form for Air-assisted sprayers for bush and tree crops.

2.1 Preparatory activities

The testing of air-assisted sprayers only takes place after it is noted that:

- A. The sprayer is clean (outside and inside);
- B. All in use nozzle sets, what are used for application of plant protection products, are present;
- C. During standing there is no leakages (water and/or oil);
- D. The power unit (tractor) is present;
- E. The to be tested sprayer is safe (PTO, etc) ;
- F. SKL –Commission Form signed by the owner of the sprayer is present.

If any of these cases applies, this has to be solved first before the test will start.

Before the test is started, the test operator must be calculating what the minimum agitation capacity must be (to see i.3.).

2.2 Testing requirements:

Approval and disapproval

The sprayer is disapproved as one or more mentioned items of in the groups a till q (to see testing form air-assisted sprayers) is assessed badly.

Presence components:

Absence of components of which can be shown that they were already not present then the machine was new, is no reason to blame. Exceptions on this are the presence of a sieve the tank opening and the requirements of the pressure gauge.

a. Controls

- a1. All controls shall function well.
- a2. All controls shall function smoothly.

b. Control of the adjust possibilities

- b1. The present adjust possibilities shall be well usefully (no being stuck or faulty) respectively can fixed in a reproducible position.
- b2. The on the desired height fixed nozzle(s) shall not vary in height in relation to the field or in relation with the trees, respectively the position of the nozzles (left and Right) shall be symmetrical. (Unless the adjustments are consciously different to correct the asymmetry of the

air flow). During the test the altitude change shall not be more than plus or minus 2 cm, unless the cause lies at the tractor.

- b3. The difference of the distance from the left respectively right bottom nozzle to the field shall not be more than 2 cm. (Unless the adjustments are consciously different to correct the asymmetry of the air flow).

c. Hoses, piping, clamps, nozzle bodies

- c1. No leakages during standing or operation, also including dripping of the nozzles, after being switched off, the nozzles shall not drip 5 s. after the spray jet has collapsed;
- c2. Hoses shall not be knotted;
- c3. There shall be no damage to the reinforcement of the hoses, which among other things comes to expression in swollen hoses.
- c4. The spraying line, the nozzle bodies and nozzles are motionlessly confirmed;
- c5. Hose clamps shall be tightened properly, it shall not be possible to remove a hose without using a tool or without having removed a security measure firstly;
- c6. Hoses shall not be cut into by hose clamps;

d. Spray liquid tank

- d1. The tank cover shall be appropriate with regard to size and form of the tank opening and cannot be motionlessly fixed or been detached by hand;
- d2. The pressure compensation of the tank shall work;
- d3. The emptying point of the tank is useful;
- d4. The liquid level indicator shall be clearly readable;
- d5. In the tank opening is a filler sieve;
- d6. There shall be a non-return device on the water-filling device of the tank.

e. Fan (s)

- e1. The fan blades shall not be polluted, declined or otherwise damaged.
The fan blades are standing in the same score.
The fan is in balance.
- e2. The protection of the fan is in proper condition, is well confirmed and has no openings that risk for personal lesion is present.
- e3. The traction of the fan may show no technical lacks (crack, slip, etc.).
- e4. Parts of the air-guiding system shall not be polluted, declined or otherwise damaged.

f. Filters

- f1. On both the suction and the pressure side of the pump is a filter;
- f2. The present filters shall be complete and in good condition.

g. Pressure gauge

- g1. The house of the pressure gauge has a diameter, which is not smaller than 63 mm;
- g2. Scale marking:
- At least 1,0 bar in the range of 5-15 bar;
- For sprayers equipped with pneumatic nozzles: the scale marking is at least 1,0 bar in the range of 1 to 8 bar
- g3. Accuracy:
The accuracy of the pressure gauge shall be +/- 1,0 bar for working pressures from 5-15 bar or 1-8 bar for sprayers with pneumatic nozzles.

h. Flowmeter (if present)

- h1. The flowmeter, if present on the sprayer, shall not deviate more than 5% from the measured value within the customary measuring range.

i. Pump test.

- i1. At a working pressure of 20 bar or maximum pressure by the manufacturer permitted, no leakages shall occur;
- i2. The pressure safety valve shall work reliably;
- i3. The pump shall have sufficient flow rate capacity in order to be able to spray at maximum working pressure as recommended by the sprayer or nozzle manufacturer with the largest nozzles mounted on the while maintaining a sufficient agitation capacity
- If only hydraulic agitation, the agitation capacity shall be at least 5% of the nominal spray tank volume;
 - If hydraulic agitation plus an additional agitation device (i.e. an injector to increase the hydraulic agitation flow of a mechanical agitation device), the agitation capacity shall be at least 2,5% of the nominal spray tank volume
 - If only a mechanical agitation device is present, on basis of by the constituent supplied documentation can be determined that the water displacement (l/min) of the mechanical agitation device is more than 5% of the nominal tank volume;

J. Pressure adjusting device

- j1. The established spraying pressure shall be maintained, at constant reversions of the pump, with an exactitude of plus or minus 1,0 bar;
- j2. After some times open and closing the main valve, the established pressure shall obtained (plus or minus 1,0 bar).

K. Agitation

- k1. A clearly visible agitation shall be achieved when spraying to the nominal p.t.o. speed, with the tank filled to the half of its nominal volume.

l. Nozzle flow rate test

- l1. The deviation of the flow rate of each nozzle of the same type shall not exceed +/- 10% of the average flow rate of the nozzles of the same type (Nozzles which are differently encoded will therefore be measured separately.)
- l2. The deviation of the average flow rate of nozzles of the same type shall not exceed +/- 10 % of the nominal flow rate indicated by the manufacturer.
- l3. Nozzles of spaying equipment what is used to spray in a slantingly upward direction shall be individual closable and adjustable

m. Vertical distribution test

The measurements are carried out:

- *with PTO reversions between 400 and 540 rev/min (towards choice of the owner of the sprayer)*
- *if moreover the number of revs of the fan is separately adjustable these must stand in the lowest score (subject to the 0-position)*
- *at a spray pressure between 5-15 bar (towards choice of the owner of the sprayer)*

m1. There shall be no obstacles in the spray jet.

The vertical distribution of the air-assisted sprayers shall meet the following requirements:

m2. The distribution pattern of the sprayer is approximately symmetrical when comparing the left and right side of the sprayer (the fluid levels in the corresponding measuring glasses of the measuring left and right of the machine does not vary more than 20% of each).

m3. The maximum of the vertical distribution is under the 2-meter height.

m4. Not more than 5% of the brought out spraying fluid shall be sprayed between the sprayer and tribe on the floor; (appraisal: visually) and not more than 5% of the brought out spraying fluid shall be sprayed above the "tree" (appraisal: visual).

NB The requirements m2 and m3 are not applying for spaying equipment what is used to spray in a slantingly upward direction (alley tree cultivation). These sprayers do not need to be tested for the vertical patternator. To these sprayers applies that as the symmetry of the spray pattern can be judged visually.

n. Pressure accumulator (if present)

n1. There shall no leakage of air from the air chamber of the accumulator;

n2. The pressure in the air chamber of the accumulator shall be adjusted to the spaying pressure of the at the sprayer present nozzles. If the accumulator was initially not adjustable, this blame reason expires;

n3. The indicator of the pressure gauge does not stand quiet.