



SPISE naaldwijk, NL

2 - 4 May 2023

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NSTS Manager

Timeline of NSTS



1997 – Sprayer testing scheme started by Agricultural Engineers Association

- **Micro-granular applicator testing**

2003 – National Sprayer Testing Scheme (NSTS) formed

- **Advisory board set up**
- **Annual figures sent to HSE (CRD) – total tests (all types), regions and sectors**

Number of tests by type

Most common faults – anti-drip, leaks static and under pressure, filters, contents gauge, boom fore/aft

2009 – Fogging machine testing – potato stores

2015 – Slug pellet applicator testing

- **Fertiliser spreader testing**

2015 – Introduction of electronic test reporting

2016 – Update of test items to include changes in ISO 16122

2023 – New database and app launched

Test Protocols



Liquid



Fertiliser

Slug pellet



Micro-granular



Foggers

2023

- **275 Test Centres**
- **695 Examiners**

- **Application made incl. fee and annual registration**
- **Confirmation of test kit**
 1. **Testing kit**
 2. **Water collection**
 3. **PPE**
- **Training of candidates – expected to have some basic knowledge of sprayers**
- **City & Guilds Level 3 qualification (sprayer operator qualification is level 2)**
- **Set up as a Test Centre and qualified Examiners registered to test sprayers**
- **Admin system for Test Centre**
- **Access to electronic reporting system and testing**

Training

1 day training for maximum 4 people

1. Classroom study
 1. Background information, health and safety, safe procedure
 2. Test equipment
 3. Legislation
 4. Test items and procedure
 5. Qualification guidance
 6. Use of app
2. Practical
 1. All test item checks explained and completed by candidates

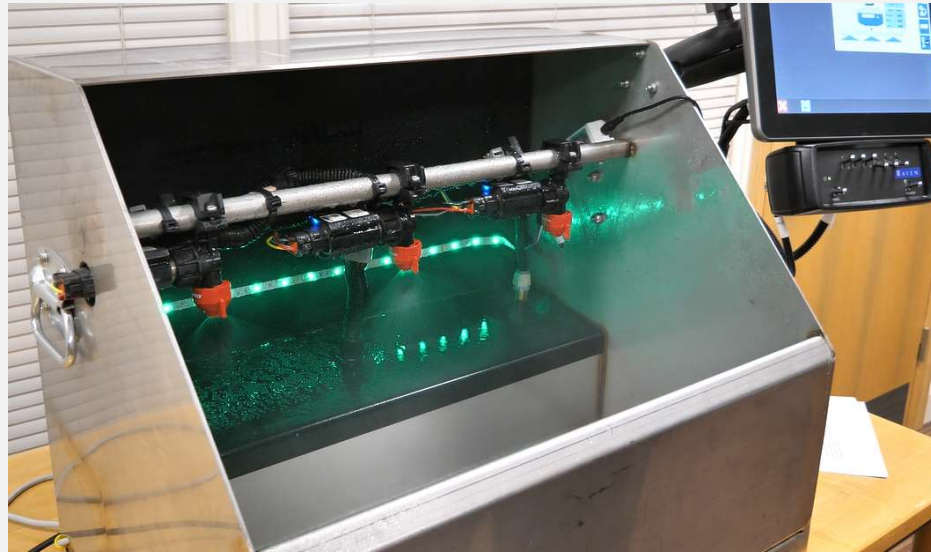
Qualification

Independent assessment

1. Arranged between company and assessment centre
2. NSTS notified of candidates who passed
3. Added to NSTS database

- 1. Quarterly newsletter**
- 2. 10 Examiner meetings each autumn across the UK**

Update Meetings



275 Test Centres, 695 Examiners

3 Auditors

100 – 120 audits per year

Maximum 5 years between audits

- 1. Check test equipment is up to date and calibrated**
- 2. Watch Examiner carry out a test (actual or dummy)**
- 3. See previous test certificates to confirm correct entry of results**
- 4. Report sent to NSTS for official sign-off and action further requirements (update test equipment, correct procedure etc.)**

National Sprayer Testing Scheme - Operator Check Sheet

Owner:	Operator:	Make:
Reg. No.	Hours:	

<p>Checklist</p> <p>Mechanical</p> <ul style="list-style-type: none"> <input type="checkbox"/> Guards, incl. PTO guard, secure and undamaged <input type="checkbox"/> Sprayer attached securely <input type="checkbox"/> No excessive structural wear or corrosion <input type="checkbox"/> Wheels and <u>tyres</u> in good condition <p>Sprayer Tank</p> <ul style="list-style-type: none"> <input type="checkbox"/> Securely fixed in frame <input type="checkbox"/> Free from leaks <input type="checkbox"/> Agitation working <input type="checkbox"/> Tank lid undamaged <input type="checkbox"/> Contents gauge working and legible <p>Nozzles</p> <ul style="list-style-type: none"> <input type="checkbox"/> Nozzles evenly spaced <input type="checkbox"/> Nozzle body orientation correct <input type="checkbox"/> DCV's working correctly <input type="checkbox"/> Sets of nozzles all the same type & size <input type="checkbox"/> Spray patterns unobstructed <p>Spray Lines</p> <ul style="list-style-type: none"> <input type="checkbox"/> Hoses and fittings in good condition <input type="checkbox"/> Free from leaks (above normal working pressure) <p>Filters</p> <ul style="list-style-type: none"> <input type="checkbox"/> Clean and undamaged <p>Boom</p> <ul style="list-style-type: none"> <input type="checkbox"/> Uniform nozzle height across the boom <input type="checkbox"/> Boom straight fore and aft <input type="checkbox"/> Boom suspension working correctly <input type="checkbox"/> Boom break-backs working correctly <input type="checkbox"/> Check mounting points and linkages for wear <input type="checkbox"/> Nozzles protected if boom hits the ground <input type="checkbox"/> Properly secure when folded for transport <p>Hydraulic and Pneumatic System</p> <ul style="list-style-type: none"> <input type="checkbox"/> Free from leaks <input type="checkbox"/> Hoses/pipes and connections in good condition <p>Electrical System</p> <ul style="list-style-type: none"> <input type="checkbox"/> Wiring undamaged and properly insulated <input type="checkbox"/> Lights and indicators working 	<p>Checklist</p> <p>Controls and Valves</p> <ul style="list-style-type: none"> <input type="checkbox"/> Master switch working correctly <input type="checkbox"/> Boom section controls working correctly <input type="checkbox"/> Pressure gauge working correctly <input type="checkbox"/> All controls and levers/switches labelled correctly <input type="checkbox"/> Pressure stable and adjustable <p>Chemical Induction System</p> <ul style="list-style-type: none"> <input type="checkbox"/> System and controls working correctly <input type="checkbox"/> Free from leaks <input type="checkbox"/> Operating levers/switches labelled correctly <input type="checkbox"/> Rinse system and container rinse working correctly <p>Tank Rinse/Personal Hygiene</p> <ul style="list-style-type: none"> <input type="checkbox"/> Tank rinse system filled and working correctly <input type="checkbox"/> Hand wash tank filled and working correctly <input type="checkbox"/> Clothing locker clean and used for purpose <p>Periodic Checks</p> <p><input type="checkbox"/> Check Nozzle Outputs (l/min)</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Nozzle</th> <th>Result</th> <th>Result</th> <th>Result</th> <th>Result</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table> <p><input type="checkbox"/> Forward Speed Check over 100 Metres</p> <p>Speed..... kmh. Time..... seconds</p> <p>Actual Speed (360/time in seconds) kmh.</p> <p>Sign</p> <p>Date</p> <p>Notes</p>	Nozzle	Result	Result	Result	Result																									
Nozzle	Result	Result	Result	Result																											



Hand-held Sprayer (Knapsack & Pressure Sprayers) Routine Check List

1. DETAILS	
Company/Owner name	
Address:	
Operator Name & NPTC No.	
Sprayer make & model	
Identification/serial number	
Inspected by (add NPTC No if different from above)	
Inspection date	

WEAR SUITABLE PPE BEFORE COMMENCING THE INSPECTION

2. GENERAL CONDITION	PASS	FAIL	REPAIR	ACTION
Clean, empty & depressurized ! Follow manufacturer's instructions !				
Check lid – seal & non return valve present & in good condition				
Tank strainer clean & in good condition				
Check tank for damage – any cracks or holes				
Inspect straps & fixing points for damage, cleanliness & security				
Inspect all hoses for damage – are they still flexible				
Check trigger & lance – are there signs of damage & leakage				
Check all filters fitted (in trigger & behind nozzle) – are they clean and in good condition				
Check nozzle – is it fitted/aligned correctly and has no signs of damage				
Check pump (piston or diaphragm) – are there signs of damage or leakage				
Electric sprayers - check condition of battery, charger and circuits				

DO NOT PROCEED TO 3 IF THERE IS A CHEMICAL RESIDUE OR SIGNS OF DAMAGE/LEAKAGE.
DECONTAMINATE BY INTRODUCING WATER/DETERGENT MIX OR PROPRIETRY CLEANING
CHEMICAL EQUIVALENT TO 10% OF THE TANK VOLUME, AGITATE, PRESSURISE & SPRAY UNTIL AIR
COMES FROM NOZZLE. REPEAT X 2. REPAIR AND/OR REPLACE PARTS AS REQUIRED.



Hand-held Sprayer (Knapsack & Pressure Sprayers) Routine Check List

3. FUNCTION CHECKS	PASS	FAIL	REPAIR	ACTION
Using a vessel of a known liquid volume, introduce clean water into the sprayer in stages until full – are the graduations on the tank visible & accurate				
Check that the straps will take the weight of the full sprayer ! TAKE CARE !				
Is the sprayer stable on the floor or bench when full				
Check for leaks with the sprayer upright and on its side				
Pressurise the sprayer – Does the pump work smoothly				
Check for leaks again, paying attention to the hoses, trigger & lance				
Spray into an appropriate container – does the on/off mechanism & also any anti-drip/flow management valves function correctly				
Check the spray pattern of the nozzle for uniformity (Further spray nozzle checks should be carried out as part of the recommended calibration regime – see Hand held Sprayer Calibration Sheet below				
Spray out all liquid until air comes from the nozzle. Is there less than a cupful (250ml) remaining in the tank				

4. PREPARE TO STORE	PASS	FAIL	REPAIR	ACTION
Ensure the sprayer is completely empty & depressurized. Follow manufacturer's instructions				
Ensure all external parts of the sprayer (including straps) are clean and dry				
Clean spray nozzles & filters in a water/detergent mix using a soft brush (Do not use sharp objects to unblock nozzles)				
Lubricate any moving parts, such as plunger cups or O rings with an appropriate lubricant/grease – Follow manufacturer's instructions				
Store securely in a frost-free place away from direct sunlight				

ALWAYS FOLLOW CORRECT DISPOSAL PROCEDURES FOR ALL RINSINGS & ENSURE THAT NO
CONTAMINATED LIQUIDS ENTER DRAINS OR WATERCOURSES



Hand-held Sprayer (Knapsack & Pressure Sprayers) Routine Check List

Sprayer Calibration Sheet

ACTION	EXAMPLE	DETAIL	WORK SPACE
1. Read the product label	Application rate Chemical dose rate Spray quality needed from spray nozzle	75 to 100 l/hectare 5 l/hectare Medium	
2. Select nozzle & type of equipment	As above. Consider using a pressure sprayer for small areas or spot treatment	372022 Blue Polijet	
3. Set pressure (if applicable)	If there is a pressure regulator, limiter or pressure control valve, select the pressure required to deliver the application rate and spray quality required – refer to nozzle manufacturers chart	Low 1 bar setting on CP Classic sprayer	
4. Measure spray width	Hold trigger & lance at comfortable height above target, spray onto dry concrete and measure the band applied in metres	1.5 m	
5. Walk & spray 100m strip and record time	Replicate the real condition as much as possible by wearing PPE and carrying a full sprayer. Repeat and take the average of the two measurements	68 secs.	
6. Spray into a measuring cylinder for the 100m time	Using a steady pumping action, spray into the vessel for the time it took to walk & spray 100m. Repeat and record the average of the two measurements	1.3 litres	
7. Calculate walking speed KPH	$360 \div \text{by time in secs for 100m} = \text{KPH}$ (360 is a constant used in all such metric calculations)	$360 \div 68 = 5.3 \text{ kph}$	
8. Calculate the spray volume /hectare	Volume collected in cylinder in litres x 100 + spray width = l/hectare (100 is a constant used in all such metric calculations)	$1.3 \times 100 \div 1.5 = 86.66 \text{ l/hectare}$	
9. Make adjustments to reach desired application rate /hectare	If necessary, alter the spray pressure, walking speed or spray width to obtain the correct application rate. If this is not practical, change nozzle. Many spray product labels give an acceptable range of application i.e. 75 to 100 l/hectare	86.66 l/hectare OK if range of 75-100 l/hectare recommended	
10. Calculate the area to spray	Measure the length and width in metres (L x W = Area to be sprayed)	Length 10m x Width 6m = 60m ²	
11. Calculate total water required for area to be sprayed	Volume collected in cylinder in litres x area to be sprayed + 100 + spray width (m) = Water required for the area to be sprayed in litres (100 is a constant used in all such metric calculations)	$1.3 \times 60 + 100 + 1.5 = 0.52 \text{ litres}$	
12. Calculate chemical required for area to be sprayed	Water required for area to be sprayed in litres x chemical rate in l/hectare from label + calculated spray volume (from 8 above) x 1000 = chemical required for the area to be sprayed in millilitres (ml) (1000 is a constant used in all such metric calculations)	$0.52 \times 5 + 86.66 \times 1000 = 30 \text{ ml}$	
13. Calculate chemical required for full or part tank	Capacity of sprayer tank (or part fill) x chemical rate in l/hectare from label + calculated spray volume from (8 above) x 1000 = chemical required in ml (1000 is a constant used in all such metric calculations)	$15 \times 5 + 86.66 \times 1000 = 865 \text{ ml}$	
14. Record data	Keep a spray record detailing all of the above	As above	





Any Questions?

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