



FLIGHT TEST STANDARDS GUIDE

AGRICULTURAL RATING ISSUE and CONTINUED COMPETENCY GRADE 1 and 2

HELICOPTER

Including additional privileges of:-

- **Topdressing**
- **Spraying**
- **Vertebrate Toxic Agent (VTA)**

**Assessment criteria for the guidance of
Agricultural Flight Examiners**

Initial Issue September 2018

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Foreword

Flight Test Standards Guides have been compiled for use by both flight examiners and flight instructors and are at present the acceptable means of compliance for use in conjunction with specific flight test syllabuses prescribed in the appropriate CAA Advisory Circulars.

Flight Test Standards Guides were developed by John Parker, the CAA General Aviation Examiner with assistance from Ritchie de Montalk of Massey University. Subsequent consultation with industry flight examiners has resulted in further refinement.

All Grade 2 and Grade 1 Agricultural Rating initial issue flight tests are to be conducted in accordance with the parameters laid down in this guide. This applies to:

- Part 141 and 137 flight testing organisations
- Delegated flight testing organisations
- All flight examiners with the examiner privilege of “Issue Grade 2 and/or Grade 1 Agricultural Rating (H).

Any feedback regarding this publication should be directed to info@caa.govt.nz

Change notice

N/A initial issue

Introduction

This guide contains standards for the ground and flight test for issue of the Agricultural Rating Grade 2 or Grade 1 and is to be used by flight examiners who hold the examiner privilege of Agricultural Rating issue (Helicopter) Grade 2 or Grade 1 (as applicable).

The additional requirements of topdressing, spraying and VTA are included for examiner guidance.

Category E flight instructors may also use this guide when preparing candidate's for flight test. However, instructors are reminded of their obligation to teach to a syllabus rather than the specific flight test requirements.

This guide is based upon the following references:

- Civil Aviation Rule Part 61 *Pilot Licences and Ratings*
- CAR Part 91 *General Operating Flight Rules*
- Advisory Circular 61-15 *Pilot licences and ratings – Agricultural ratings*
- Advisory Circular 61-16 *Pilot licences and ratings – Pilot chemical ratings*
- NZAIP Planning Manual
- Gronlund, N.E., & Linn, R.L. (1990). Measurement and evaluation in teaching. (6th ed.) New York: Macmillan

Flight test standard concept

Civil Aviation Rule Part 61 and the associated Advisory Circular (AC) specify the areas in which knowledge and skill must be demonstrated by the candidate before a pilot licence or rating is issued.

Flight Test Standards Guides provide the flexibility to permit the CAA to publish flight test standards containing specific *Tasks* (procedures and manoeuvres) in which pilot competency must be demonstrated.

Adherence to the provisions of the appropriate flight test standard is mandatory for the evaluation of candidates.

Where reference is made to the AIP this means the Aeronautical Information Publication New Zealand.

Flight test guide description

Flight Test Standards Guides are available from the CAA web site at www.caa.govt.nz (under “Pilots”) and are distributed free of charge to current examiners. They are amended by replacement when a change to Part 61 deems it necessary.

This guide has been designed to minimise the degree of subjectivity in the test although the examiner will still have to exercise judgement.

The assessment criteria define performances that are ‘ideal’, ‘not yet competent’ and, more importantly, a ‘competent’ performance is also defined.

The term ‘competent’ is used to describe a minimum pass, while the terms thorough, sound, accurate, correct, fully, and exactly are used to describe ‘ideal’ performances at the top end of the scale.

The rating scale 0 – 100, with competence achieved at 70+, and an above average performance achieved at 85+, may also be used if preferred.

Flight examiner responsibility

The examiner who conducts the flight test is responsible for determining that the candidate meets the standards outlined in the objective of each task.

The examiner shall meet this responsibility by taking an ACTION that is appropriate for each task and where appropriate role-play a pilot of average ability.

For each task that involves "knowledge only" elements, the examiner will orally question the candidate on those elements.

For each task that involves both "knowledge and skill" elements, the examiner will orally question the candidate on the knowledge elements and ask the candidate to perform the skill elements.

Advice to flight examiners

The examiner is not (necessarily) designated as the pilot-in-command. However, examiners are credited with the flight time during an issue flight test and may log the flight time as pilot-in-command [CAR 61.31 (f)], but not as instructor.

Flight test standard description

Tasks contain procedures and manoeuvres appropriate to the demonstration required for Agricultural Rating Grade 2 and Grade 1 (Helicopter) issue.

The OBJECTIVE that appears below the task relates that task to the regulatory requirement and lists the important elements that must be satisfactorily performed to demonstrate competency in that task.

The minimum acceptable standard of performance for a task is described in the column stating COMPETENT performance.

The IDEAL performance of a task is described in the right column. In many cases the perfect performance is not achievable but is simply stated as an ideal against which performance can be measured.

Unacceptable performance of a task is described in the NOT YET COMPETENT column.

The ACTION assists the flight examiner in ensuring that the task objective is met, and in some instances, alerts the flight examiner to areas upon which emphasis should be placed.

The conditions under which the task is to be performed are expanded on under the 'satisfactory/unsatisfactory performance' headings, which follow.

Satisfactory performance

The ability of a candidate to perform the required task is based on a demonstration of competency in:

- (a) Executing tasks within the aircraft's performance capabilities and limitations as laid down in the aircraft's flight manual, including use of the aircraft's systems;
- (b) Executing emergency procedures and manoeuvres, appropriate to the aircraft and in accordance with recommended procedures;
- (c) Piloting the aircraft with smoothness and accuracy, in accordance with the limitations detailed in the Flight Test Guide for CPL (H) issue;
- (d) Executing all exercises involving balanced flight with no more than 1/4 ball sustained deflection in slip or skid;
- (e) Exercising good judgement/decision making and maintaining situational awareness;
- (f) Showing complete control of the aircraft, with the successful outcome of a task never seriously in doubt;

Use of distractions during flight tests

Other than simulated emergencies, artificial distractions are not appropriate.

Unsatisfactory performance

During an issue flight test, if in the judgement of the examiner, the candidate does not meet the minimum standard of any task performed, the task demonstration is failed and therefore the flight test is failed.

The examiner or candidate may discontinue the test at any time after the failure of a task makes the candidate ineligible to pass the issue flight test. The test will only be continued with the consent of the candidate.

Consistently exceeding CPL (H) tolerances or failure to take prompt corrective action when tolerances are exceeded is unsatisfactory performance.

Flight that is maintained within the stated tolerances but consistently deviates from the maximum positive limit to the maximum negative limit is unsatisfactory performance.

Any action or lack of action by the candidate, which requires corrective intervention by the examiner to maintain safe flight, will be disqualifying.

Unsatisfactory performance in any test item during an issue flight test will result in the candidate and the instructor being advised of the failure aspects and the additional training believed necessary before a further ground and flight test may be undertaken.

Recording unsatisfactory performance

During an issue flight test, if performance is unsatisfactory the flight examiner must record this on the flight test report against the specific task.

Pass or fail, a copy of the flight test report must be submitted to CAA.

Use of the Flight Test Standards Guide

The CAA requires that each flight test be conducted in compliance with the appropriate flight test standard. When using the guide the examiner must evaluate the candidate's knowledge and skill in sufficient depth to determine that the standards of performance listed for all tasks are met.

The examiner is not required to follow the exact order in which the tasks appear but may change the sequence or combine tasks with similar objectives to save time. Examiners will develop a plan of action that includes the order and combination of tasks to be demonstrated by the candidate in a manner that will result in an efficient and valid test.

Examiners will place special emphasis on areas of aircraft operation that are most critical to flight safety. Among these are correct aircraft control, sound judgement in decision-making, threat and error management, spatial orientation and collision avoidance. Although these areas may not be shown under each task, they are essential to flight safety and will receive careful evaluation throughout the flight test. If these areas are shown in the objective, additional emphasis will be placed on them.

Aircraft and equipment requirements for flight test

The candidate is required, under rule 61.25, to provide an aircraft appropriate for the flight test. The aircraft must be equipped for, and its operating limitations must not prohibit, the pilot operations required during the test. Required equipment will include:

- (a) Fully functioning dual flight controls, (AC61-15 provides for some special cases in agricultural aircraft) and
- (b) Those instruments essential to the manoeuvres to be demonstrated, visible to both pilots without excessive parallax error, and
- (c) At least three-point lap-and-sash harness, and
- (d) Intercommunication equipment acceptable to the flight examiner.

The candidate is required to provide adequate and private facilities for briefing prior to and after the flight test.

Flight test prerequisites

A candidate for an Agricultural Rating Grade 2 or Grade 1 issue flight test is required by rule 61.21 as a prerequisite to:

- (a) Have proof of their identity.
- (b) Have an up-to-date, summarised and certified logbook containing evidence of the required flight experience.
- (c) Hold an appropriate current medical certificate, and
- (d) Hold a type rating for the aircraft to be used.

In addition, rule 61.701 requires the candidate to:

- (e) Hold at least a current private pilot licence (H) (for Grade 2 issue),
or
- (f) Hold at least a current commercial pilot licence (H) (for Grade 1 issue), and
- (g) Meet specified minimum flight experience requirements, and
- (h) Hold a current Pilot Chemical Rating, and
- (i) Have successfully complete a training course in one or more of the following ratings:
 - (i) aerial topdressing rating:
 - (ii) aerial spraying rating:
 - (iii) aerial VTA rating.

ASSESSMENT CRITERIA
Grade 1 or 2 Agricultural Rating
General (applies to all disciplines)

Task: Personal preparation

Objective: To determine that the candidate demonstrates a professional attitude by;

- (a) Presenting him or her self for the test in a timely manner; suitably attired (in keeping with a professional qualification) and fit for flying.
- (b) Presenting an up to date summarised and certified pilot's logbook and the appropriate current licence for Grade 2 or Grade 1 issue (H) with evidence of an appropriate aircraft type rating.
- (c) Demonstrating knowledge of the privileges and currency requirements of the Agricultural Rating (Grade 2 or Grade 1 as applicable).

Action:

The examiner will;

- (a) Observe the candidate's punctuality, attire, and as far as practicable, determine that the candidate is fit to fly.
- (b) By examination of the candidate's logbook, determine that all statutory flight time requirements have been met.
- (c) Ensure that the candidate holds an appropriate current pilot's licence and type rating for the aircraft to be used.
- (d) Determine that the candidate has completed the required syllabus of training appropriate to topdressing, spraying and or VTA (as applicable).
- (e) Determine that the candidate has adequate knowledge of the privileges and currency requirements of the agricultural rating.

Personal Preparation

Rating **70** **85** **100**

Not yet competent **COMPETENT** **Ideal**

(1) Unacceptably late	(1) Arrives punctually	
(2) Dressed inappropriately for flying (personal protective equipment)	(2) Dressed in keeping with a professional qualification	(2) Exudes professionalism
(3) Is physically or mentally unfit for test	(3) Fit but nervous	(3) Fit, enthusiastic and confident
(4) Minimum flight experience not completed	(4) Minimum flight experience completed and correctly recorded	(4) Logbook records are neat, complete and correct in all respects
	(5) Holds an appropriate current pilot licence and type rating	
(6) The candidate's syllabus of training does not meet the requirements of the Agricultural Rating Advisory Circular for the applicable discipline	(6) The candidate has completed a syllabus of training that meets the requirements of the Agricultural Rating Advisory Circular for topdressing, spraying and/or VTA (as applicable)	(6) The candidate has completed a syllabus of training that exceeds all the requirements of the Agricultural Rating Advisory Circular for the applicable discipline
(7) The candidate is unaware of the currency requirements and/or privileges of the agricultural rating	(7) The candidate demonstrates adequate knowledge of the currency and privileges of the agricultural rating	(7) The candidate demonstrates a thorough knowledge of the currency and privileges of the agricultural rating

ASSESSMENT CRITERIA

Task: Aircraft documents

Objective: To ensure that the candidate;

- (a) Exhibits adequate knowledge of the aircraft's documentation.
- (b) Exhibits adequate knowledge of aircraft loading.
- (c) Exhibits adequate knowledge of aircraft performance.

Action:

The examiner will;

- (a) Orally question and/or require the candidate to explain aircraft documentation and determine that the candidate's performance meets the objective.
- (b) Orally question and/or require the candidate to explain aircraft loading and determine that the candidate's performance meets the objective.
- (c) Orally question and/or require the candidate to explain aircraft performance and determine that the candidate's performance meets the objective.

Aircraft Documents

Rating **70** **85** **100**

Not yet competent **COMPETENT** **Ideal**

(1) The candidate's knowledge and/or ability to explain aircraft documentation is frequently deficient	(1) The candidate exhibits adequate, knowledge of aircraft documentation	(1) The candidate exhibits a thorough knowledge of aircraft documentation
(2) The candidate's knowledge and ability to explain aircraft loading is frequently deficient	(2) The candidate exhibits adequate knowledge of aircraft loading	(2) The candidate exhibits a thorough knowledge of aircraft loading
(3) The candidate's knowledge and/or ability to explain aircraft performance is frequently deficient	(3) The candidate exhibits adequate, knowledge of aircraft performance	(3) The candidate exhibits a thorough knowledge of aircraft performance

ASSESSMENT CRITERIA

Task: Operational planning

Objective: To determine that the candidate prepares for agricultural operations by;

- (a) Inspecting the work area for hazards and boundary recognition.
- (b) Preparing a plan, with the use of GPS (if applicable), giving due consideration to sun glare, turbulence and fuel management.
- (c) Considering the operation of the loading area and the positioning of the aircraft for loading.
- (d) Briefing the loader driver on the selection of loads, signals to be used and emergency procedures.

Action:

The examiner will;

- (a) Observe the candidate's procedures for establishing the boundaries of the work area and the presence of hazards.
- (b) Determine that the candidate's plan is practical and gives sufficient consideration to glare, turbulence and fuel reserves.
- (c) Observe the candidate's use of the loading area and the positioning of the aircraft for loading.
- (d) Role-play a loader driver of average ability for the purpose of assessing the effectiveness of the briefing on procedures for loading, signals to be used and emergency procedures.

Operational Planning

Rating 70 85 100

Not yet competent **COMPETENT** **Ideal**

(1) The candidate misidentifies a work area boundary and/or fails to identify a significant hazard	(1) The candidate establishes the boundaries of the work area and identifies all relevant hazards	(1) The candidate positively establishes the boundaries of the work area and identifies all hazards
(2) The candidate produces a plan that does not consider sun glare, turbulence and/or fuel requirements	(2) The candidate produces a practical plan that gives due consideration to glare, turbulence and fuel reserves	(2) The candidate produces a practical plan, based on GPS information, that minimises the hazards created by sun glare, turbulence and fuel requirements
(3) The candidate fails to consider the operational use of the loading area in relation to the positioning of the aircraft	(3) The candidate utilises the loading area to position the aircraft for safe and efficient loading	(3) The candidate maximises the loading area to provide for safe and efficient loading of the aircraft
(4) The candidate does not brief the loader driver on procedures to be used for loading, signals to be used and/or emergency procedures	(4) The candidate briefs the loader driver on procedures for loading, signals to be used and relevant emergency procedures	(4) The candidate thoroughly briefs the loader driver on procedures for loading, signals to be used and all relevant emergency procedures

ASSESSMENT CRITERIA

Task: Flight between the airstrip and the working area

Objective: To determine that the candidate demonstrates a satisfactory level of airmanship, threat and error management and situational awareness by;

- (a) Selecting an appropriate altitude for transit between the airstrip and the work area.
- (b) Considering engine failure procedures during the take-off and transit cruise.
- (c) Minimising turbulence effects from flying parallel to high ground, up and down slopes, crossing ridges and/or within valleys.
- (d) Avoiding or mitigating the effect of illusions produced by a false or non-existent horizon.

Action:

The examiner will;

- (a) Observe the candidate's airmanship, threat and error management and situational awareness to determine that the candidate's performance meets the objective.

Flight between the Airstrip and the Working Area

Rating 70 85 100

Not yet competent	COMPETENT	Ideal
(1) The candidate chooses an unsuitable altitude or route between the airstrip and the work area	(1) The candidate chooses a suitable altitude and route for transit between the airstrip and the work area	(1) The candidate chooses the most suitable altitude and route for transit between the airstrip and the work area
(2) The candidate does not consider the adverse effects of engine problems on the take-off or transit	(2) The candidate has a plan of action in the event of engine problems during the take-off and/or transit	(2) The candidate plans the most suitable course of action in the event of engine problems during the take-off and transit
(3) The candidate makes no attempt to minimise the effects of turbulence or illusions produced by high ground and/or the lack of a true horizon	(3) The candidate minimises the effects of turbulence or illusions produced by high ground and/or the lack of a true horizon through the selection of an appropriate route between the airstrip and the work area	(3) The candidate minimises the effects of turbulence or illusions produced by high ground or the lack of a true horizon through the selection of the most appropriate route between the airstrip and the work area

ASSESSMENT CRITERIA

Task: Record keeping

Objective: To ensure that the candidate has adequate knowledge of;

- (a) Daily flight/work records and pilot logbook entries.
- (b) Aircraft technical log use.
- (c) Pilot maintenance records.
- (d) Defect recording and rectification.
- (e) Occurrence and incident reporting.
- (f) Overdue and accident procedures.

Action:

The examiner will;

- (a) Orally question the candidate about the use of daily flight/work records, pilot logbooks, aircraft technical logs, pilot maintenance records, defect recording and rectification.
- (b) Ensure the candidate has adequate knowledge of occurrence and incident reporting procedures.
- (c) Question the candidate's knowledge of overdue and accident procedures to ensure that the candidate's knowledge is appropriate.

Record Keeping

Rating **70** **85** **100**

Not yet competent

COMPETENT

Ideal

<p>(1) The candidate's knowledge of daily flight/work records, pilot logbooks, aircraft technical logs, pilot maintenance records, defect recording and rectification is deficient</p>	<p>(1) The candidate's knowledge of daily flight/work records, pilot logbooks, aircraft technical logs, pilot maintenance records, defect recording and rectification is adequate</p>	<p>(1) The candidate demonstrates a thorough knowledge of daily flight/work records, pilot logbooks, aircraft technical logs, pilot maintenance records, defect recording and rectification</p>
<p>(2) The candidate's knowledge of occurrence and/or incident reporting procedures is inadequate</p>	<p>(2) The candidate's knowledge of occurrence and/or incident reporting procedures are adequate</p>	<p>(2) The candidate demonstrates a thorough knowledge of occurrence and/or incident reporting procedures</p>
<p>(3) The candidate misses safety critical items from the overdue or accident procedures</p>	<p>(3) The candidate demonstrates an adequate knowledge of overdue and accident procedures</p>	<p>(3) The candidate demonstrates a thorough knowledge of overdue and accident procedures</p>

ASSESSMENT CRITERIA

Topdressing

Task: Application techniques

Objective: To ensure that the candidate has adequate knowledge of;

- (a) Product characteristics, application rates, use of formulae and techniques.
- (b) The operational use of GPS for tracking (if applicable).
- (c) The effect of topdressing height and slope on the swath width.
- (d) Single pass, half overlap, racetrack and squeeze.
- (e) The effect of wind on ground speed and application pattern.
- (f) The appropriate use of the various application patterns.
- (g) Emergency procedures.

Action:

The examiner will question (as required) the candidate's knowledge of;

- (a) Product characteristics, application rates, and application techniques.
- (b) The operational use of GPS (if applicable).
- (c) The effect of height, ground speed, slope and wind on the application pattern.
- (d) Application patterns and their appropriate use.
- (e) Hazard assessment and emergency procedures.

Application Techniques

Rating 70 85 100

Not yet competent **COMPETENT** **Ideal**

(1) The candidate's lack of product knowledge, use of formulae and/or application rates creates a safety risk	(1) The candidate exhibits a competent level of product knowledge, application rates, use of formulae and techniques	(1) The candidate exhibits comprehensive product knowledge, a thorough understanding of application rates, use of formulae and appropriate techniques
(2) The candidate cannot demonstrate operational GPS tracking (where applicable)	(2) The candidate demonstrates a competent level of operational GPS tracking (if applicable)	(2) The candidate's demonstration of operational GPS tracking is above average
(3) The candidate does not appropriately estimate the effect of slope, wind, ground speed and/or height on the application pattern	(3) The candidate satisfactorily estimates the swath width and product drift with regard to slope, wind, ground speed, height and the application pattern	(3) The candidate accurately estimates the swath width and product drift with regard to all environmental factors
(4) The candidate does not choose an appropriate application pattern and/or cannot adequately explain the use of the various patterns	(4) The candidate chooses an appropriate application pattern	(4) The candidate chooses the most appropriate application pattern
(5) The candidate's emergency procedures are deficient	(5) The candidate's emergency procedures are satisfactory	(5) The candidate's emergency procedures are correct for the situation

ASSESSMENT CRITERIA

Topdressing

Task: Environmental responsibilities

Objective: To determine that the candidate;

- (a) Appropriately establishes the application area, buffer and or exclusion zones and the correct application rate.
- (b) Considers the physical environment with regard to water bodies and any other sensitive area.
- (c) Confines product distribution within the application boundary by maintaining buffer zone clearances.
- (d) Understands third party risk.
- (e) Considers the hazards associated with livestock and or wildlife on the operation of the aircraft and/or product application.
- (f) Makes a valid decision to accept or decline a task based on environmental considerations.

Action: The examiner will;

- (a) Monitor the candidate's establishment of the application area and buffer and/or exclusion zones with regard to water bodies and/or sensitive areas.
- (b) Observe the candidate's calculation of the appropriate application rate and ability to confine the product distribution within the boundary whilst maintaining the buffer zone clearances.
- (c) Question the candidate on the application of Appendix A to CAR Part 137 operations with regard to third party risk.
- (d) Observe and/or question the candidate's procedures for dealing with hazards associated with livestock and/or wildlife on the operation of the aircraft and the application of product.
- (e) Simulate a task (if necessary) that requires an 'accept or decline' decision based on environmental considerations and determine that the candidate's decision making processes meet the objectives.

Environmental Responsibilities

Rating

70

85

100

Not yet competent

COMPETENT

Ideal

<p>(1) The candidate does not establish a buffer and/or exclusion zone (as applicable) and/or a suitable application rate</p>	<p>(1) The candidate establishes the application area with buffer and/or exclusion zones (as applicable) and a suitable application rate</p>	<p>(1) The candidate defines the application area with identifiable buffer and/or exclusion zones (as applicable) and the most suitable application rate</p>
<p>(2) The candidate does not confine product distribution to the application area</p>	<p>(2) The candidate confines product distribution to the application area and avoids environmentally sensitive areas</p>	<p>(2) The candidate confines product distribution within the buffer zone and avoids all environmentally sensitive areas</p>
<p>(3) The candidate is unaware of third party risk considerations</p>	<p>(3) The candidate considers third party risk</p>	<p>(3) The candidate applies third party risk considerations to the operation</p>
<p>(4) The candidate does not give due consideration to hazards posed by wildlife and or stock on the operation of the aircraft and/or product distribution</p>	<p>(4) The candidate gives due consideration to wildlife and/or stock on the operation of the aircraft and product distribution</p>	<p>(4) The candidate eliminates hazards posed by wildlife and stock on the operation of the aircraft and product distribution</p>
<p>(5) The candidate makes an inappropriate decision in accepting or declining the (simulated) task based on environmental considerations</p>	<p>(5) The candidate makes a valid decision to accept or decline the (simulated) task based on environmental considerations</p>	

ASSESSMENT CRITERIA

Topdressing

Task: Aircraft & role equipment handling & care

Objective: To ensure that the candidate can explain or demonstrate;

- (a) Care of the aircraft including the clearing of ice and fogging.
- (b) Serviceability checks.
- (c) The fuel policy including refuelling and hot refuelling.
- (d) Inspecting, maintaining, installing and removing role equipment.
- (e) The limitations of pilot maintenance.
- (f) The daily pre-flight inspection.

Action:

The examiner will;

- (a) Question or observe (as appropriate) the candidate's knowledge of aircraft care and role equipment handling to determine that the candidate's knowledge is appropriate.

Aircraft and Role Equipment Handling and Care

Rating

70

85

100

Not yet competent

COMPETENT

Ideal

(1) The candidate cannot explain or demonstrate the clearing of ice or windscreen fogging	(1) The candidate adequately explains or demonstrates the clearing of ice and/or windscreen defogging	(1) The candidate thoroughly explains or demonstrates the clearing of ice and windscreen defogging
(2) The candidate cannot explain or demonstrate the serviceability checks appropriate to the aircraft type	(2) The candidate explains or demonstrates the serviceability checks appropriate to the aircraft type	(2) The candidate thoroughly explains and demonstrates the serviceability checks appropriate to the aircraft type
(3) The candidate cannot explain the refuelling procedures or hot refuelling (if applicable)	(3) The candidate demonstrates or explains refuelling procedures in accordance with company procedures and hot refuelling (if applicable)	(3) The candidate demonstrates or explains accurately the refuelling procedures in accordance with company procedures and hot refuelling (if applicable)
(4) The candidate incorrectly demonstrates the instillation and/or removal of role equipment, or cannot explain the applicable inspection and/or maintenance procedures	(4) The candidate demonstrates or explains the inspection, maintenance, instillation and removal of role equipment as applicable	(4) The candidate demonstrates a thorough knowledge of the instillation, removal, inspection and maintenance of applicable role equipment
(5) The candidate is not aware of any limitation to pilot maintenance	(5) The candidate adequately explains the limitations of pilot maintenance	(5) The candidate thoroughly explains the limitations of pilot maintenance
(6) The candidate misses safety critical items during the pre-flight inspection	(6) The candidate demonstrates an adequate pre-flight inspection	(6) The candidate demonstrates a thorough pre-flight inspection

ASSESSMENT CRITERIA

Spraying

Task: Application techniques

Objective: To ensure that the candidate has adequate knowledge of;

- (a) The types of materials to be sprayed and factors affecting calibration including the use of formulae.
- (b) The effect of wind on ground speed and the application pattern including the effect of slope.
- (c) The effect of airspeed and spray height on droplet recovery and swath pattern.
- (d) Single pass half overlap, racetrack and squeeze spray patterns.
- (e) The effect of spraying into wind and downwind versus crosswind on swath pattern.
- (f) The operational use of GPS for tracking (if applicable).
- (g) Keeping straight on markers (without GPS), estimating swath width and product drift including the effect of airspeed, wind and slope.
- (h) Product label and technical recommendations, water rate requirements and the various types of nozzle and their effect on VMD.
- (i) Penetration requirements in relation to the target species and canopy.

Action:

The examiner will observe and question (as required) the candidate's knowledge of;

- (a) Types of materials to be sprayed and factors affecting calibration.
- (b) Environmental effects on the spray pattern, swath, and application area.
- (c) Product characteristics, application rates, spray nozzle and VMD effects on the penetration requirements for the target species.
- (d) The operational use of GPS (if applicable) and procedures for using markers for non GPS operations.

Application Techniques

Rating **70** **85** **100**

Not yet competent

COMPETENT

Ideal

(1) The candidate cannot apply knowledge of the factors affecting calibration to the material to be sprayed	(1) The candidate applies adequate knowledge of the factors affecting calibration to the material to be sprayed	(1) The candidate applies superior knowledge of the factors affecting calibration to all materials to be sprayed
(2) The candidate's lack of knowledge of environmental effects (height, speed, slope, wind) on the spray pattern, swath and/or application area creates a hazard	(2) The candidate demonstrates adequate knowledge of environmental effects (height, speed, slope, wind) on the spray pattern, swath and application area	(2) The candidate demonstrates in depth knowledge of environmental effects (height, speed, slope, wind) on the spray pattern, swath and the application area
(3) The candidate cannot satisfactorily explain (or demonstrate if applicable) product characteristics, application rates and/or the effects of nozzle selection and VMD	(3) The candidate satisfactorily explains (or demonstrates) product characteristics, application rates and/or the effects of nozzle selection and VMD	(3) The candidate demonstrates in depth knowledge of product characteristics, application rates and the effects of nozzle selection and VMD
(4) The candidate cannot demonstrate operational GPS tracking (where applicable)	(4) The candidate demonstrates a competent level of operational GPS tracking (if applicable)	(4) The candidate's demonstration of operational GPS tracking is above average

ASSESSMENT CRITERIA

Spraying

Task: Factors affecting drift and droplet recovery

Objective: To ensure that the candidate can explain the effect of;

- (a) Primary drift, secondary drift and evaporation.
- (b) Wind velocity and airspeed.
- (c) Droplet size and the orientation of nozzles to the airflow.
- (d) Humidity, fog, drizzle, temperature, slope and atmospheric stability.
- (e) Nozzle selection, boom pressure and droplet size.
- (f) Boom width and rotor vortices.
- (g) Aerodynamic shattering and penetrating adjuvants.
- (h) Anti-drift agents and boom shut off.

Action:

The examiner will;

- (a) Question appropriately to determine that the candidate's knowledge of the effect of drift, evaporation, wind velocity, airspeed, droplet size and nozzle orientation to the airflow are appropriate.
- (b) Question appropriately to determine the candidate's knowledge of atmospheric effects including humidity, fog, drizzle, temperature and inversion layers is appropriate.
- (c) Question the candidate's knowledge of the effect of vortices, boom width, aerodynamic shattering and penetrating adjuvants is appropriate.
- (d) Question and/or observe the use of anti-drift agents and the use of boom shut off systems.

Factors Affecting Drift and Droplet Recovery

Rating

70

85

100

Not yet competent

COMPETENT

Ideal

<p>(1) The candidate cannot explain the effect of drift, evaporation, wind velocity, airspeed and/or droplet size and nozzle orientation to the airflow</p>	<p>(1) The candidate adequately explains the effect of drift, evaporation, wind velocity, airspeed, droplet size and nozzle orientation to the airflow</p>	<p>(1) The candidate demonstrates a thorough knowledge of the effect of drift, evaporation, wind velocity, airspeed, droplet size and nozzle orientation to the airflow</p>
<p>(2) The candidate cannot explain atmospheric effects of humidity, fog, drizzle, temperature and/or inversion layers on the operation</p>	<p>(2) The candidate adequately explains the atmospheric effects of humidity, fog, drizzle, temperature and inversion layers on the operation</p>	<p>(2) The candidate demonstrates a thorough knowledge of the atmospheric effects of humidity, fog, drizzle, temperature and inversion layers on the operation</p>
<p>(3) The candidate is unaware of the effect of vortices, boom width, aerodynamic shattering and/or penetrating adjuvants</p>	<p>(3) The candidate demonstrates adequate knowledge of the effect of vortices, boom width, aerodynamic shattering and penetrating adjuvants</p>	<p>(3) The candidate demonstrates a thorough knowledge of the effect of vortices, boom width, aerodynamic shattering and penetrating adjuvants</p>
<p>(4) The candidate makes inappropriate use of anti-drift agents and/or the boom shut off system</p>	<p>(4) The candidate demonstrates adequate knowledge and/or appropriate use of anti-drift agents and the boom shut off system</p>	<p>(4) The candidate demonstrates a thorough knowledge of the use of anti-drift agents and boom shut off systems and demonstrates their use appropriately</p>

ASSESSMENT CRITERIA

Spraying

Task: Environmental responsibilities

Objective: To determine that the candidate;

- (a) Appropriately establishes the application area, buffer and or exclusion zones and the correct application rate.
- (b) Considers the physical environment with regard to water bodies and any other sensitive area (including off target species).
- (c) Confines product distribution within the application boundary by maintaining buffer zone clearances.
- (d) Considers the hazards associated with third parties, livestock and or wildlife on the operation of the aircraft and/or product application (including insecticide toxicity to bees).
- (e) Makes a valid decision to accept or decline a task based on environmental considerations.
- (f) Decontaminates the aircraft and spray gear appropriately with regard to sensitive crops and the operational period.

Action:

The examiner will;

- (a) Monitor the candidate's establishment of the application area and buffer and/or exclusion zones with regard to water bodies and/or sensitive areas.
- (b) Observe the candidate's calculation of the appropriate application rate and ability to confine the product distribution within the boundary whilst maintaining the buffer zone clearances.
- (c) Observe and/or question the candidate's procedures for dealing with hazards associated with third parties, livestock and/or wildlife on the operation of the aircraft and the application of product.
- (d) Simulate a task (if necessary) that requires an 'accept or decline' decision based on environmental considerations and determine that the candidate's decision making processes meet the objectives.
- (e) Observe decontamination of the aircraft and spray gear (as appropriate).

Environmental Responsibilities

Rating

70

85

100

Not yet competent

COMPETENT

Ideal

<p>(1) The candidate does not establish a buffer and/or exclusion zone (as applicable) and/or a suitable application rate</p>	<p>(1) The candidate establishes the application area with buffer and/or exclusion zones (as applicable) and a suitable application rate</p>	<p>(1) The candidate defines the application area with identifiable buffer and/or exclusion zones (as applicable) and the most suitable application rate</p>
<p>(2) The candidate does not confine product distribution to the application area</p>	<p>(2) The candidate confines product distribution to the application area and avoids environmentally sensitive areas</p>	<p>(2) The candidate confines product distribution within the buffer zone and avoids all environmentally sensitive areas</p>
<p>(3) The candidate does not give due consideration to hazards posed by third parties, wildlife and/or stock on the operation of the aircraft and/or product distribution</p>	<p>(3) The candidate gives due consideration to third parties, wildlife and/or stock on the operation of the aircraft and product distribution</p>	<p>(3) The candidate eliminates hazards posed by third parties, wildlife and stock on the operation of the aircraft and product distribution</p>
<p>(4) The candidate makes an inappropriate decision in accepting or declining the (simulated) task based on environmental considerations</p>	<p>(4) The candidate makes a valid decision to accept or decline the (simulated) task based on environmental considerations</p>	
<p>(5) The candidate's decontamination procedures are inappropriate or non-existent</p>	<p>(5) The candidate's decontamination procedures are appropriate to the task</p>	<p>(5) The candidate's decontamination procedures are appropriate and thorough</p>

ASSESSMENT CRITERIA

Spraying

Task: Aircraft & role equipment handling & care

Objective: To ensure that the candidate can explain or demonstrate;

- (a) Care of the aircraft including, cleaning the bubble and blades, clearing ice and fogging and the effect on performance.
- (b) Serviceability checks.
- (c) The fuel policy including refuelling and hot refuelling.
- (d) Inspecting, maintaining, installing and removing role equipment.
- (e) The limitations of pilot maintenance.
- (f) The daily pre-flight inspection including role equipment maintenance programmes.
- (g) Spray equipment components and operation, including jettison systems (where applicable).

Action:

The examiner will;

- (a) Question or observe (as appropriate) the candidate's knowledge of aircraft care and role equipment handling to determine that the candidate's knowledge is appropriate.

Aircraft and Role Equipment Handling and Care

Rating

70

85

100

Not yet competent

COMPETENT

Ideal

(1) The candidate cannot explain or demonstrate the cleaning of the bubble, rotors and/or the clearing of ice or windscreen fogging	(1) The candidate adequately explains or demonstrates the cleaning of the bubble, rotors and the clearing of ice and windscreen fogging	(1) The candidate thoroughly explains or demonstrates the cleaning of the bubble, all rotors and the clearing of ice and windscreen fogging
(2) The candidate cannot explain or demonstrate the serviceability checks appropriate to the aircraft type	(2) The candidate explains or demonstrates the serviceability checks appropriate to the aircraft type	(2) The candidate thoroughly explains and demonstrates the serviceability checks appropriate to the aircraft type
(3) The candidate cannot explain the refuelling procedures and/or hot refuelling (if applicable)	(3) The candidate demonstrates or explains refuelling procedures in accordance with company procedures and hot refuelling (as applicable)	(3) The candidate demonstrates or explains accurately the refuelling procedures (including hot refuelling if applicable) in accordance with company procedures
(4) The candidate is not aware of any limitation to pilot maintenance	(4) The candidate adequately explains the limitations of pilot maintenance	(4) The candidate thoroughly explains the limitations of pilot maintenance
(5) The candidate misses safety critical items during the pre-flight inspection	(5) The candidate demonstrates an adequate pre-flight inspection	(5) The candidate demonstrates a thorough pre-flight inspection
(6) The candidate incorrectly demonstrates the instillation or removal of role equipment, or cannot explain the applicable inspection and/or maintenance procedures	(6) The candidate demonstrates or explains the inspection, maintenance, instillation and removal of role equipment as applicable	(6) The candidate demonstrates a thorough knowledge of the instillation, removal, inspection and maintenance of applicable role equipment
(7) The candidate cannot explain equipment components and/or their operation (including jettison systems where applicable)	(7) The candidate 's knowledge of equipment components and their operation (including jettison systems where applicable) is adequate	(7) The candidate demonstrates a thorough knowledge of equipment components and their operation (including jettison systems where applicable)

ASSESSMENT CRITERIA

Vertebrate Toxic Agent (VTA)

Task: Application techniques

Objective: To ensure that the candidate has adequate knowledge of;

- (a) Types of material to be sown, physical properties, particle size, flow ability and the effect on swath.
- (b) Product characteristics, formulae for calculating application rates and airspeed versus swath width, height, drift and meteorological aspects.
- (c) HSNO classifications and controls, bio-accumulation, water solubility and attributes relevant to potential adverse effects.
- (d) The operational use of GPS for tracking.
- (e) Procedure turns.
- (f) Operation of bucket controls, timing and effect of jettisoning.
- (g) The effect on aircraft performance and procedures for equipment malfunction.
- (h) Clean up procedures and the reassessment of obstacles and hazards including wire strike avoidance.
- (i) Emergency procedures.

Action: The examiner will question (as required) the candidate's knowledge of;

- (a) Material types, properties, particle size, flow ability and effect on swath.
- (b) Product characteristics, application rates, spray patterns and meteorological aspects.
- (c) HSNO classifications.
- (d) The operational use of GPS for tracking.
- (e) The use of procedure turns and hopper controls including the effect on aircraft performance of jettisoning the load and/or equipment malfunction.
- (f) Clean up, hazard reassessment, emergency procedures and wire avoidance.
- (g) Emergency procedures.

Application Techniques

Rating **70** **85** **100**

Not yet competent

COMPETENT

Ideal

(1) The candidate's lack of product knowledge and/or application rates creates a safety risk	(1) The candidate exhibits a competent level of product knowledge, application rates and techniques	(1) The candidate exhibits comprehensive product knowledge, a thorough understanding of application rates and appropriate techniques
(2) The candidate's knowledge of HSNO classifications and controls is deficient	(2) The candidate's knowledge of HSNO classifications and controls is appropriate	(2) The candidate demonstrates a thorough knowledge of HSNO classifications and controls
(3) The candidate cannot demonstrate operational GPS tracking	(3) The candidate demonstrates a competent level of operational GPS tracking	(3) The candidate's demonstration of operational GPS tracking is above average
(4) The candidate does not appropriately execute procedure turns and/or operates bucket controls inappropriately	(4) The candidate appropriately executes procedure turns and operates bucket controls appropriately	(4) The candidate demonstrates procedure turns and the operation of hopper controls without fault
(5) The candidate is unaware of the effects of jettisoning the load or equipment malfunctions on performance	(5) The candidate demonstrates a satisfactory understanding of the effects of jettisoning the load and the effect on performance of equipment malfunctions (as applicable)	(5) The candidate demonstrates a thorough understanding of the effects of jettisoning the load and the effect on performance of equipment malfunctions
(6) The candidate's clean up and/or emergency procedures are deficient	(6) The candidate's clean up, emergency and wire avoidance procedures are satisfactory	(6) The candidate's clean up and emergency procedures are efficient and correct

ASSESSMENT CRITERIA

Vertebrate Toxic Agent (VTA)

Task: Environmental responsibilities

Objective: To determine that the candidate;

- (a) Meets notification requirements through appropriate signage placed in the correct and required areas for the public and other affected parties.
- (b) Ensure that signage has the correct and required information and is removed on completion of the operation.
- (c) Appropriately establishes the application area, buffer and or exclusion zones and the correct application rate.
- (d) Considers the physical environment with regard to water bodies and any other sensitive area.
- (e) Confines product distribution within the application boundary by maintaining buffer zone clearances.
- (f) Considers third party risk.
- (g) Considers livestock and or wildlife implications – reporting any livestock within the boundary.
- (h) Makes a valid decision to accept or decline a task. If accepted, the pilot clearly identifies the person responsible for overall management, and ensures that all responsibility can and will be complied with.

Action:

The examiner will;

- (a) Orally question the candidate's procedures for notifying the public and other affected parties.
- (b) Monitor the candidate's establishment of the application area and buffer and/or exclusion zones with regard to water bodies and/or sensitive areas.
- (c) Observe the candidate's calculation of the appropriate application rate and ability to confine the product distribution within the boundary whilst maintaining the buffer zone clearances.
- (d) Question the candidate on minimising third party risk.
- (e) Observe and/or question the candidate's procedures for dealing with hazards associated with livestock and/or wildlife within the boundary.
- (f) Simulate a task (if necessary) that requires an 'accept or decline' decision based on environmental considerations and determine that the candidate's decision making processes meet the objectives.

Environmental Responsibilities

Rating **70** **85** **100**

Not yet competent

COMPETENT

Ideal

(1) Fails to provide adequate notification	(1) Provides or adequately explains the notification process required	(1) Provides and/or explains in depth the notification process required for VTA
(2) The candidate does not establish a buffer and/or exclusion zone (as applicable) and/or a suitable application rate	(2) The candidate establishes the application area with buffer and/or exclusion zones (as applicable) and a suitable application rate	(2) The candidate defines the application area with identifiable buffer and/or exclusion zones (as applicable) and the most suitable application rate
(3) The candidate does not confine product distribution to the application area	(3) The candidate confines product distribution to the application area and avoids environmentally sensitive areas	(3) The candidate confines product distribution within the buffer zone and avoids all environmentally sensitive areas
(4) The candidate is unaware of third party risk considerations	(4) The candidate applies appropriate third party risk controls	(4) The candidate thoroughly explains and applies third party risk controls to the operation
(5) The candidate does not consider the implications of wildlife and/or stock within the distribution area and/or does not report it	(5) The candidate gives due consideration to wildlife and/or stock and reports any observed within the distribution boundary	(5) The candidate reports and eliminates hazards posed to wildlife and stock within the distribution area
(6) The candidate makes an inappropriate decision in accepting or declining the (simulated) task based on environmental responsibilities	(6) The candidate makes a valid decision to accept or decline the (simulated) task based on environmental responsibilities	(6) The candidate makes a valid decision to accept or decline the (simulated) task based on environmental responsibilities and thoroughly explains the decision making process