AERIAL FERTILISER APPLICATION PRACTICES

This section of the Spreadmark Code applies to the aerial application of fertiliser and is in two parts. Part A deals with Spreadmark protocols and procedures. Part B is the Aerial Spreadmark Code of Practice.

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PART A THE AERIAL SPREADMARK PROTOCOLS

1. SPREADMARK SYSTEM STANDARD FOR AERIAL OPERATORS

1.1 SCOPE

Spreadmark Accredited operators shall have an active quality management programme. The programme shall include the requirement for a quality policy, and quality indicators, a recording system for non-conformances, corrective and preventive actions, internal audit reviews and management reviews. This programme shall also include requirements dealing with work instructions and customer complaints. The quality management standard that will be used by the auditor to assess the degree to which the operator's management system meets customer needs and Spreadmark standards is described in the Quality Assurance, Rules and Procedures section of the NZ Agricultural Aviation Association's Accreditation programme.

1.2 SPREADING EQUIPMENT

1.2.1 The operator will hold a current Approved Aerial Pattern Test Certificate for all fertiliser spreading equipment or there will be a system in place to ensure that non-certified equipment is not used for jobs where Spreadmark Accreditation has been requested or specified.

1.2.2 Where the operator has spreading devices with a demonstrably repeatable performance (i.e. internal company checking shows that the spreader continues to perform consistently to an external calibration check over a sustained period) and where there is appropriate evidence of maintenance and on-going checking of the spread pattern, then the Approved Aerial Pattern Test Certificate may be extended for up to two years at a time by the Spreadmark auditor.

1.2.3 It is expected that all spreaders in a Spreadmark Accredited operator's fleet will hold a current Approved Aerial Pattern Test Certificate. Where the same spreader is used with another fixed wing aircraft of the same type, the Certificate will be deemed to still apply. Where the spreading system is operated by helicopter using a sling or strop, the use of a different helicopter has no effect on the spreading performance so the Certificate will also still apply. In all other cases a separate Approved Aerial Pattern Test Certificate will be required. When auditing due recognition will be made for equipment or spreaders where it is reasonable that they not be certified (eg new spreaders which have not yet been tested)

1.2.4 To achieve Spreadmark Accreditation, spreading devices should be operated at a bout width within the limits that are defined by the Approved Aerial Pattern Test Certificate.

1.2.5 Written records shall be kept of all spreading equipment checks and calibrations.

1.2.6 Application equipment with Approved Aerial Pattern Test Certification shall be clearly identified as such and a copy of the Certificate shall be made available on request.

1.3. OPERATORS

1.3.1 All pilots shall be competent in relation to their understanding and application of the Approved Aerial Pattern Test Certificate and Spreadmark Accreditation.

2. SPREADMARK AUDITOR PROTOCOL FOR AERIAL OPERATORS

2.1. SCOPE

This protocol sets out the roles and responsibilities of the Auditor for Spreadmark Accreditation of Aerial Operators.

2.2 APPOINTMENT

2.2.1 The Fertiliser Quality Executive Committee shall nominate the Auditor and approve the appointment, for such a term as the Executive Committee shall determine. This decision will be taken in consultation with the NZAAA

2.2.2 The Auditor shall have received appropriate auditor training and shall be familiar with the agricultural aviation industry.

2.2.3 The Auditor cannot also be a Spreading Equipment Tester as it is important that the functions of testing equipment and auditing be kept entirely separate.

2.3. COMPANY CONTACTS

2.3.1 The Auditor will maintain a register of operators and nominated contact people. The nominated contact people are to be the primary points of contact for the Auditor with the operator.

2.4. NOTIFICATION

2.4.1 Applications for Spreadmark Accreditation will normally be made to the NZAAA, as part of an application for NZAAA Accreditation. NZAAA will advise the Executive Director, FQC each time a valid application for Spreadmark Accreditation is received. The Auditor will be notified by NZAAA

2.4.2 Applications from operators directly to the Executive Director for Spreadmark Accreditation independently from NZAAA Accreditation shall also be considered.

2.4.3 The Auditor will negotiate with the contact person for the operator for a suitable time to conduct the audit.

2.5. AUDITS

2.5.1 During audits the Auditor will audit the operator against the Aerial Spreadmark Code of Practice. The audit will focus on outcomes and evaluate whether or not they are being achieved.

2.5.2 After the site audit is complete a recommendation as to the suitability of the operator for Spreadmark Accreditation will be sent to the Executive Officer, NZAAA who will advise the Executive Director FQC, who will confirm to the Executive Officer that Spreadmark Accreditation has been approved.

2.5.3 An audit report will be sent to the nominated operator contact person. It will include a copy of the recommendation relating to Spreadmark Accreditation sent to the Executive Officer NZAAA.

2.6. AUDIT FREQUENCY

2.6.1 Spreadmark Accreditation audits will normally be carried out on a two yearly basis from the date of the Accreditation audit.

2.6.2 The Auditor may determine that an increased audit frequency (1 year) is appropriate if there are non-conformances or complaints against the company are sustained, or a decreased audit frequency where the candidate has been Spreadmark Accredited for 4 years (ie 2 cycles) and no non-conformances have been found. The operator may be subject to 1 audit during the 4-year period. Accredited operators shall send a copy of an annual internal audit report to the Spreadmark Auditor during the 4 year audit cycle.

2.7. STATUS REPORT

2.7.1 The Auditor will maintain a status report showing the current status of each Spreadmark Accredited operator, when it is next due to be audited and any current issues that relate to it.

2.7.2 The status report shall be supplied to the Executive Director every six months or within ten working days of it being requested.

2.8. RECORDS

2.8.1 The Auditor shall maintain proper records. These records will include audit reports, status reports and correspondence.

2.8.2 Records, or copies of records, shall be supplied to the Executive Director upon request and in accordance with the Spreadmark Confidentiality Protocol.

2.9. CONFIDENTIALITY

2.9.1 The Auditor will not communicate information about any operator to anyone other than the operator itself through its nominated contact person, the Executive Officer NZAAA or the Executive Director, FQC. Requests for information in relation to Spreadmark Accreditation are to be referred to the Executive Director.

2.9.2 All information held by the Auditor on an operator is to be made available to that operator on request by the nominated operator contact person.

2.9.3 For further information refer to the Spreadmark Confidentiality Protocol.

3. APPROVED AERIAL SPREADING EQUIPMENT TESTERS PROTOCOL

3.1. SCOPE

3.1.1 This protocol sets out the roles and responsibilities of Approved Spreading Equipment Testers for pattern testing of aerial spreading equipment

3.2. APPROVAL POLICIES

3.2.1 In consultation with NZAAA, the Fertiliser Quality Council Executive Committee shall approve Aerial Spreading Equipment Testers.

3.2.2 The term of approval shall be two years or any other lesser term that the Fertiliser Quality Council Executive Committee determines.

3.2.3 Approved Spreading Equipment Testers will be appropriately qualified and will be able to display practical experience relevant to the agricultural aviation industry.

3.2.4 The register of Approved Spreading Equipment Testers, by name, will be held by the Executive Director or his nominee. All applications to alter the terms of an Approved Equipment Tester's approvals must be made in the first instance to the Executive Director.

3.2.5 An Approved Spreading Equipment Tester will be a fit and proper person capable of managing spreader equipment testing, but who is also able to maintain the integrity of the Spreading Equipment Testing process.

3.2.6 Any complaint about an Approved Spreading Equipment tester must in the first instance be made to the Executive Director for resolution.

3.3. APPROVAL PROCESSES

3.3.1 Upon receipt of a request to become a Approved Spreading Equipment Tester the Executive Director or his nominee will contact the applicant to arrange a suitable time for an audit of their equipment, processes and software to evaluate whether or not they comply with the requirements of this Code.

3.3.2 On the advice and recommendation from his nominee, the Executive Director will seek approval from the Executive Committee of the Fertiliser Quality Council for the applicant to be added to the register of Approved Testers for aerial operators. Upon approval by the Executive Committee the applicant will be advised that they are able to carry out pattern testing and certification for the Spreadmark programme for aerial operators and that their name will be added to the register of Approved Spreading Equipment Testers for aerial operators.

3.4. OPERATOR CONTACTS

3.4.1 Approved Aerial Spreading Equipment Testers shall offer testing services to all operators seeking Approved Aerial Pattern Test Certification.

3.4.2 Candidates for Spreadmark Accreditation may select the services of any Aerial Approved Spreading Equipment Tester at a testing fee to be fixed between the parties.

3.5. SPREADMARK SPREADING EQUIPMENT TESTING

3.5.1 All testing done by Approved Spreading Equipment Testers for Spreadmark purposes will be done in accordance with the Aerial Spreadmark Code of Practice.

3.6. AUDITS

3.6.1 The Approved Aerial Spreading Equipment Tester shall be subject to regular audit by the Executive Director, Fertiliser Quality Council or his nominee. The audit will be to determine that the standards specified in the Aerial Spreadmark Code of Practice are being maintained through the Spreading Equipment Certificate test. The auditor will make available the results of the audit to the Fertiliser Quality Council Executive Director on request.

3.6.2 If in the opinion of the auditor the Spreadmark approved specifications are not being met, the Executive Director will require the Approved Spreading Equipment Tester to provide an explanation within ten days. If the matter cannot be resolved the Executive Director may suspend the Approved Spreading Equipment Tester from Spreadmark testing.

3.6.3 The auditor may be asked to conduct an audit of the Approved Spreading Equipment Tester if requested by the Executive Director following any complaint.

3.6.4 In all matters in dispute the decision of the Executive of the Fertiliser Quality Council will be binding on the parties.

3.7. LIMITATIONS

3.7.1 Disputes that may arise between Spreadmark Accredited companies and Approved Spreading Equipment Testers shall be managed according to the Spreadmark Disciplinary and Deregistration Procedure in the Spreadmark Operational Rules

4 PROCEDURE FOR SPREADMARK ACCREDITATION

4.1 SCOPE

This is the procedure for the Accreditation of aerial operators under the Spreadmark Scheme.

4.2 APPLICATION FOR SPREADMARK ACCREDITATION

4.2.1. Enquiries regarding Spreadmark Accreditation may be directed to the Executive Director, FQC or the NZAAA, who will forward an official Spreadmark Accreditation Application Form

4.2.2. Applications for Spreadmark Accreditation will normally be made to NZAAA in writing on the official application form and must be accompanied by the application fee. These applications will normally be as part of an application for NZAAA Accreditation. The application fee is not refundable in the event that application does not proceed or is unsuccessful.

Applications from non-members of NZAAA for Aerial Spreadmark Accreditation only will be made to the Executive Director FQC. The application fee in this case is $700 + GST

4.2.3. Upon receipt of the application form the NZAAA shall verify that the application is complete and that the appropriate fee is attached and shall then advise the Executive Director.

4.2.4. The NZAAA advises the Aerial Spreadmark Auditor to audit the candidate operator.

4.2.5. Following the audit the auditor will report with a recommendation to the Executive Officer NZAAA as set out in the auditor protocol. If the Auditor does not consider the requirements of Spreadmark to be met then the applicant company will be advised in writing of the findings and actions to be made.

4.2.6 If the operator applicant has been recommended for Spreadmark Accreditation the Executive Director FQC amends the register of Spreadmark Accredited Operators.

APPLICATION FOR SPREADMARK ACCREDITATION

This form is to be used by operators that seek Aerial Spreadmark Accreditation.

When complete, attach a cheque for $200 + GST ($225) to cover the application fee and send to:

The Business Manager
NZAAA
PO Box 2096
WELLINGTON

Operator name	
Postal Address:	.....
Physical address:	.....
Contact Person:	.....
Phone Number:	.....
Fax Number:	.....
Other Contacts:	.....
Number of aircraft:	.....

We recognise that the Spreadmark scheme requires operators to have:

- An Approved Aerial Pattern Test Certificate
- An active quality management system.

We agree that upon being granted Spreadmark Accreditation we:

- will abide by the Spreadmark Codes of Conduct;
- will abide by such Rules, Protocols and Policies as are made by the Fertiliser Quality Council;
- will pay the annual Spreadmark promotion and administration levy of ($200 + GST);
- allow reasonable access to the appointed Aerial Spreadmark Auditor;

We agree that if Spreadmark Accreditation is withdrawn or lapses all mention of Spreadmark made in the company publications or on the company vehicles or any other use of the Spreadmark trademark will cease.

…….……. …. …….……

(Signature) (Name)

……
(Date)

5 REGISTERS

This section of the Spreadmark Code of Practice contains the following registers:

5.1 Approved Spreading Equipment Testers,

5.2 Collectors Approved for Use with Spreadmark Testing, and

5.3 Spreadmark Type Approved Spreading Equipment .

NOTE: *The Executive Director will maintain, and make public, a list operators who hold Spreadmark Accreditation. This list is not included in this Code.*

5.1 APPROVED SPREADING EQUIPMENT TESTERS

Below is a list of people, and the organisations that they are employed by, that are recognised by the Fertiliser Quality Council as Approved Aerial Pattern Testers and are able to carry out fertiliser spreading equipment testing and certification for the Aerial Spreadmark programme.

Russell Horrell
Lincoln Ventures Ltd
PO Box 133
Lincoln
Phone: (03) 325-3700

5.2 APPROVED COLLECTORS, DATA COLLECTION AND REPORTING FOR AERIAL SPREAD PATTERN TESTING

5.2.1 Collector and Insert design

The following is a list of collector designs that are approved by the Fertiliser Quality Council for use in aerial pattern testing, together with standardised processing formats.

Organisations wishing to have an additional collector and collector insert designs approved should advise the Executive Director, Fertiliser Quality Council, PO Box 414, Ashburton and obtain a comparative test report from Dr I. Yule, NZ Centre for Precision Agriculture, Massey University, Palmerston North.

The following is a list of collector and collector insert designs approved by the Fertiliser Quality Council for use in Aerial Spreadmark pattern testing:

- The collector and baffle design of the NZ Groundspread Fertiliser Association. These are available from:
  The Executive Director
  NZ Groundspread Fertilisers Association
  PO Box 414
  Ashburton

- The collector design of NZAAA. These are available from
  The Business Manager
  NZAAA
  PO Box 2096
  Wellington

5.2.2 Data Collection and Reporting

a) Data Collection - general

Pattern test data for an aircraft distribution system, whether for liquids or solids shall include a graph of the swath pattern from a single pass, a graph of the bout width vs. the CV% for evenness of application and the following information:

- Wind speed and direction at the test site (relative to the flight path or the line of collectors)
- Fertiliser physical properties, including SGN, UI (for liquids this may be expressed as VMD or ($D_{v0.1}$ $D_{v0.5}$ and $D_{v0.9}$)) and Bulk Density.
- Application rate[1] (intended and achieved, kg per ha)
- Flight path (centerline collector)
- Application height (estimated + or – 5m)
- Ground speed (km/hr)
- Collector specification (size, spacing, number)
- Weight of fertiliser per collector[2] (gm)
- Application equipment type – see also Appendix E in Part B of this Code

[1] Certification is valid only where the achieved application rate is within 30% of that intended
[2] Scales accurate to +/- 0.1 gm

b) Data collection – application equipment (solids)

Solids Spreader	Data	Report
None	Dimensions of outlet	……..mm long …….. …….mm wide
	Type of outlet (clamshell/louvre/other)	
	Fairings (describe)	
Ram Air	Front (inlet) dimensions	……..mm
	Rear (outlet) dimensions	……..mm
	Number of vanes	
Powered (disc)	Disc diameter	……..mm
	Disc open or shrouded	
	Disc height (ie vane height)	……mm
	Disc speed	……rpm
	Number and shape of vanes (describe)	
	Feed point onto disc	
	Flow metering device (eg orifice plate)	

c) Data collection application equipment (liquids)

Spray system	Data	Report
Nozzles	Nozzle type -Flood jet, fan, disc/core, other (describe**)**	
	Number of nozzles	
	Nozzle orientation (90^0 = straight down, 180^0 = straight back)	
	Nozzle spacing (mm) Include diagram for variable spacing	……..mm
Spray Boom	Location (in relation to wing or helicopter skids – describe)	
	Boom pressure	……..kPa
	Boom width/rotor or wing span	……m boom width ……m rotor/wing span

5.2.3 Data collection and reporting

A spread pattern is determined by flying the aircraft over a line of approved collectors, then retrieving and weighing the amount of fertiliser retained in each collector. The data are used to plot a graph of the basic swath pattern from a single pass of the aircraft.

The following conditions must be met when measuring the transverse distribution pattern for an Approved Aerial Pattern Test Certificate. Wind speed and direction are particularly important along with the need to identify the flight path of the aircraft in relation to the line of collectors

Item	Requirement
Spreading equipment	Clean and sound working condition
Hopper loading	Hopper content to be not less than one quarter full at the conclusion of a pattern test
Application rate	The application rate measured at the nominated BW shall be within 30% of the nominated application rate
Speed over collectors	Typical operating speed
Number of passes over collectors	One per spread pattern test
Wind speed and direction[1]	≮ not greater than 15 km/hr and ≺ not more than ± 15^0 in the direction of travel. Tests can be into or down wind but the ground speed of the aircraft shall be recorded

[1] Note that for cross winds, the collectors at each end of the line shall be empty.

Reporting
Approved Aerial Spreading Equipment Testers will, at the conclusion of the test, produce an Approved Aerial Pattern Test Certificate. An Aerial Pattern Test is approved by the Executive Director, Fertiliser Quality Council or his nominee.

The Certificate must show the data collected (see Section 5.2.2 a] and b]) and include:

- The operators name and aircraft identification
- The Certified Bout Width for each fertiliser tested –see Note below
- A description of the physical characteristics of that fertiliser including product name, bulk density (BD), uniformity index (UI), size guide number (SGN) and a graph of the particle size distribution (see Table E1 in Part B).
- The date of the test and the expiry date of the certificate. The expiry date will be two years after the date of the test.

Note: The Spreadmark Certified Bout Width is the maximum bout width where the CV is 15% or less for nitrogenous fertilisers and 25% or less for non-nitrogenous fertilisers

5.3 SPREADMARK TYPE APPROVED SPREADING EQUIPMENT

Companies manufacturing aerial spreading equipment and wishing to gain type certification for their equipment should contact the Executive Director, Federated Farmers, PO Box 414, Ashburton.

The protocol for type testing of aerial equipment can be found in this Code. Refer Part B of Appendix 7.

There are currently no aerial fertilizer spreading equipment types which are recognised by Spreadmark as being able to reproducibly comply with Spreadmark requirements.