



New Zealand Crop Quality Assurance Scheme

Grower Manual

September 2009

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Quality Statement

To provide ultimate confidence in New Zealand produced grain by verifying traceability and adherence to industry standards of production, storage and delivery.

Introduction

Customer and consumer perceptions and expectations toward food quality, food safety and good production practices are strongly held and can be very damaging to a particular industry or product not meeting them.

There are a host of physical, chemical and biological hazards that can pass from properties into the food chain. The level of quality management required will depend on the risks to food safety, hazards affecting quality and customer requirements.

To help maintain consumer confidence that cereals or grains are a low risk food product, Governments around the world are changing their approach to food safety. The end point inspection systems based on sight, smell and touch were satisfactory for identifying spoiled products and pests. They are not however, suited to the invisible: microbial pathogens and chemical residues for example.

The development of the QAGrainz Scheme will allow industry to continue to meet customer and consumer expectations and obligations to produce safe food.

Success can only be achieved if every link in the chain, from field to food, does its best to reduce or eliminate food borne hazards.

The QAGrainz Scheme also ensures traceability: the ability to trace-back the inputs of a processed grain product i.e. from the final consumable product back to the farm paddock.

Governments are converting to an approach for controlling and monitoring food safety called Hazard Analysis Critical Control Point (HACCP). HACCP is a systematic method, which uses seven principles:

- 1 Conduct hazard analysis
- 2 Identify critical control points (CCP for each step)
- 3 Establish critical limits
- 4 Establish monitoring requirements for each CCP
- 5 Establish corrective action
- 6 Keep records
- 7 Verify the HACCP system is working correctly

While New Zealand's own Food Act (1996) simply states "food must be safe", other Jurisdictions will be requiring Government-to-Government HACCP based assurances for the safety of food.

Critical control points are steps in a property's operation where one can apply a control to prevent or minimise a hazard from occurring, and then set acceptable safety limits to ensure the safety limits are not exceeded.

In approaching the New Zealand Crop Quality Assurance Scheme Grower Manual the Taskforce deliberately chose a series of standards and a HACCP approach, which are internationally recognised.

Using the QAgainz Scheme, New Zealand grain growers can demonstrate that their product has advantages over a product that does not have a Quality Assurance scheme.

It is important for our industry to adopt a global view and irrespective of consumers, suppliers must look to develop minimum product safety standards. To meet the challenges ahead, we must be proactive rather than reactive. Suppliers will need to accept responsibility for product not reaching minimum safety standards in the future.

In achieving this outcome, the Taskforce anticipates that the recognition and overall improved integrity, fostered through the adoption of the QAgainz Scheme, will enhance our reputation as a supplier of quality product, and will meet sophisticated demands on both the international and domestic markets.

Suppliers adhering to the QAgainz Scheme will be able to demonstrate to customers that their product is safe to eat, of an acceptable quality, and is fully traceable.

Membership Conditions

By signing and returning the application form, growers agree to be bound by the conditions of the Scheme.

The manual makes reference to applicable industry codes of practice that growers should be aware of, which are referenced in the further information section of this manual. Growers should also be aware of the need to comply with contractual, statutory and local body obligations. This scheme in no way overrides those obligations.

The manual uses a rating assessment system to rank criteria that growers must adhere to in order for continuing registration.

What do the reference numbers, C, M, and R mean in this manual?

C = Critical

M = Major

R = Recommendation

(Reference Number) = corresponding item in checklist

Audit Procedure

An audit procedure has been developed where a Taskforce nominated independent third party will carry out audits of all registered growers to ensure compliance to the Scheme rules as explained in the manual.

The Taskforce envisage that the audit frequency will be on a three yearly cycle to ensure continuing compliance to the Scheme conditions.

Appendix 2 contains the audit checklist so that growers may verify all conditions of membership are being met prior to the formal audit.

Grower Status

Membership status has been categorised as follows:

A = Fully Accredited - Registered and audited (Green)

B = Provisionally Accredited - Registered but not audited (Blue)

C = Registered but audit requires correction to major non-compliance (Yellow)

D = Suspended (Red)

Registered members will be recorded on a database, which will allow participating grain buyers access to their membership status. This information will be confidential to those participating grain buyers and will be limited to grower registration number, grower/business name and grower status.

For Registered Growers, a **Critical** non-compliance at an assessment audit results in immediate suspension (Status D), and processors **will not** accept deliveries.

This situation will remain, until such time that a subsequent audit, at the cost of the grower, ensures that all critical non-compliances have been satisfactorily rectified.

Major non-compliances need to be rectified as soon as possible, but within one year of the audit date. (Status C). This will require a subsequent audit at the cost of the grower. Further failure to comply will result in a Critical non-compliance and subsequent suspension (Status D).

A **Recommendation** is a good management practice, which you may choose to implement within your operation.

Participating grain buyers will accept deliveries from members with A, B and C status.

Contact Details

For further information, or general enquiries on the Grower Manual contact the following:

Taskforce Chairman
New Zealand Crop Quality Assurance Scheme
P.O. Box 13646
Christchurch
Phone (03) 365 0881
Fax (03) 377 2991

Email info@uwg.co.nz
Website: www.uwg.co.nz

The following bodies are represented on the New Zealand Crop Quality Assurance Scheme Taskforce:

- New Zealand Bakers Association
- New Zealand Flour Millers Association
- New Zealand Feed Manufacturers Association
- United Wheatgrowers (NZ) Ltd
- International Malting Company New Zealand Ltd/Malteurop
- New Zealand Grain and Seed Trade Association

Paddock Identification and Seed Sown Information

Management must have a system in place, where grain can be reliably traced back to the paddocks that they were grown in. A farm plan including paddock areas shall be used to identify where crops were grown each season. (1)

Seed sown by New Zealand growers is normally certified (either under the New Zealand Seed Certification Scheme, overseas certified, or Grain Merchant supplied) or is "farm-saved" seed from previous harvest years.

Either way it is important that the seed sown to produce a crop can be verified as true to type and be fully traceable back to its origin.

When sowing certified seed, at least one seed label attached to the bags must be saved for each paddock and kept in a safe place for a minimum of one year. Or alternatively purchase invoices must be retained for all seed purchased and made available for inspection at the audit. (2)

A record shall be maintained for all cereal seed sowings (3). The records should include information such as paddock, sowing date, seed type, seed sowing rate, etc.

If seed is "farm-saved" seed, a record to verify the traceability must be maintained. This involves retaining a certified seed label from the original seed sown, and information recorded about where the original crop was grown and stored. (4)

1.	A system is in place, where grain can be reliably traced back to the paddock where grown. • Farm map	C
2.	Seed sown can be identified and verified by bag label or by purchase invoice/receipt.	C
3.	Record of all sowings is retained which includes fertiliser and chemicals used. • Sowing Records	C
4.	Growers sowing "farm-saved" seed can verify seed origin and history.	C

Fertiliser Application to Growing Crops

Fertiliser application to field grown crops should aim to maintain soil fertility, minimise leaching and minimise the risk of food safety hazards.

A system for recording all fertiliser applications must be maintained (5).

The minimum information recorded should include:

- Paddock
- Crop Type
- Date Applied
- Product Applied
- Application Rate
- Application Method
- Name of Applicator

It is recommended that purchase invoices are retained for all fertiliser purchases and made available for inspection at the audit if required. Likewise growers that use contractors to apply fertilisers should also make these invoices available at audits to assist in verification of applications. (6)

For further recommendations on the storage and use of fertiliser on farms refer to the Fertiliser Code of Practice. (27)

5.	A system for recording all fertiliser and nutrient applications is in place. • Fertiliser Application Records	C
6.	Purchase or contractor invoices retained for inspection at audit.	R

Chemical Application to Growing Crops

Chemical contamination of cereals is classified as a significant food safety hazard and therefore all precautions must be taken to ensure that residue levels are acceptable to the industry.

Growers should always observe the withholding period for each chemical as per the manufacturers instructions. In particular careful consideration should be taken before applying final fungicide treatments. Information kept on silo contents (See Appendix 1) in relation to harvest dates will assist in determining compliance.

Growers handling chemicals are encouraged to attend the GROWSAFE® or equivalent course or use registered GROWSAFE® contractors. See Further Information section for GROWSAFE® contact details. (7)

Some form of Chemical Application record must be maintained and include all applications of herbicides, growth regulators, fungicides and insecticides during the growing cycle. Minimum information recorded should include: (8)

- Paddock
- Crop Type
- Date Applied
- Chemical Product Applied
- Application and Water Rate
- Application Method
- Name of Applicator

Purchase invoices are to be retained for all chemical purchases and made available for inspection at the audit if required. Likewise growers that use contractors to apply chemicals should also make these invoices available at audits to assist in verification of applications. (9)

Designated storage facilities shall be used for the storage of chemicals on farms. Agrichemicals must be clearly identified and labelled at all times. (10)

For further recommendations on the safe storage and use of Agrichemicals on farm refer to the Health and Safety Act requirements and New Zealand Standards NZS 8409: "Code of Practice for the Management of Agrichemicals" and it's amendments.

7.	<p>Growers hold current GROWSAFE® certification or equivalent/supervision by certified person:</p> <ul style="list-style-type: none"> • Sight and record current GROWSAFE® Introductory or Applied Certificate • Sight and record current GROWSAFE® Registered Chemical Applicators Certificate 	R
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8.	Chemical application record is maintained. Minimum information recorded should include: <ul style="list-style-type: none"> • Paddock • Crop Type • Date Applied • Chemical Product Applied • Application Rate • Water rate (R) • Application Method • Name of Applicator 	C
9.	Purchase or contractor invoices retained for inspection at audit.	C
10.	Agrichemicals are kept in designated store and clearly identified.	M

Pre-Harvest Storage and Equipment Preparation

Grain storage facilities and equipment all potentially threaten the quality of harvested grain. Action should be taken well before intake to ensure a pest and contaminant free environment. Most empty storage facilities contain pests, which can contaminate newly stored grain. Cleaning alone will not control these. Insecticides will not necessarily completely eliminate insects in store. However, good hygiene, effective grain drying (if required), and well-targeted pest control and monitoring all combine to maintain grain quality while in storage on farms.

Ensure all machinery and equipment used to handle grain is thoroughly cleaned and fully maintained prior to harvest. This includes combine harvesters, augers, elevators, trucks, trailers, bins and all silo or storage facilities. (11)

A reliable moisture meter should be available and regularly calibrated against a standard sample. (12)

Any use of insecticide sprays or smoke generators on storage or harvest facilities must be recorded. (13)

For further recommendations refer to the relevant sections of the Post Harvest Grain Management poster or the summarised report available from Foundation for Arable Research (FAR).

11.	Storage facilities and harvesting equipment cleaned and maintained prior to season start.	C
12.	Regular calibration of moisture meters.	R
13.	All pre-harvest insecticide treatments on silos or storage facilities are recorded. <ul style="list-style-type: none"> • Pre harvest storage insecticide records 	C

Harvest Sampling of Crops

The objective of sampling is to obtain a sample of a size suitable for tests in which the same constituents are present as in the seed lot and in the same proportions.

The quantity of seed tested is minute when compared with the size of the grain line with which it is intended to represent. No matter how accurately the laboratory testing is done, the results can only show the quality of the sample submitted for analysis. Consequently, every effort must be made to ensure that the samples collected at harvest, or from the silo, accurately represent the composition of the seed lot in question.

The purpose of sampling at harvest time is to establish that the initial quality of grain is fit for the intended market. For quality determinations, representative samples are needed. Collection methods can influence results but sample size can be very small.

Growers should be able to demonstrate a formal procedure to collect representative samples from incoming loads of grain. A minimum sample size of 5 kilograms per grain line is recommended. However the sample selection should be random and unbiased to ensure a representative sample is collected. (14)

For grain to be stored on farm it is recommended that harvest samples be collected as the grain transfers from the truck or trailer into the auger, therefore the sample frequency will be dependant on the size of the load.

Samples should be kept in a clean container that can be sealed preventing the sample being contaminated or tampered with in any way. This should be clearly identified as to its contents and stored in a safe, vermin and weatherproof area. (15)

Samples shall be kept for a minimum of three months after the final delivery of the line of grain. (16)

14.	A formal procedure to collect representative samples from incoming loads of grain is followed.	M
15.	Samples stored on farm are clearly identified, sealed to prevent tampering, and are stored in a safe, vermin and weatherproof area.	M
16.	Samples are kept for a minimum of three months after final delivery of the line of grain.	M

Grain Drying

The moisture content of grain or seed at harvest can severely affect the storage life and/or condition of the stored product. The higher the moisture levels at harvest, the more important and critical grain drying becomes. Not only will high moisture content lead to potential quality downgrades but this can also attract and encourage storage pests to infest the grain or seed.

If drying is deemed necessary, or the normal practice, all attempts must be made to ensure that the integrity and quality of the grain is maintained at all times. (17)

If the drying process requires that grain be physically shifted from one silo or bin to another or from property to another, then a record of these movements must be kept so as to avoid potential contamination errors from occurring. (18)

Samples shall be collected after the grain-drying process is carried out. Most processors require post-drying samples as a contractual obligation. (19)

For further information on Grain Drying refer to "The Drying and Storage of Grain and Herbage Seeds"

17.	Grain drying process is carried out ensuring that the crop integrity and quality of the grain is maintained at all times.	M
18.	Any grain movements during drying process are recorded. • Silo Content Records	C
19.	Samples are collected after drying process.	M

On-Farm Grain Storage

Most growers, particularly in the South Island, store some or all of their harvested crops on farm either in silos or other storage facilities. The length of time grain is stored on farms can range from a few days to many months. Therefore in order for confidence in the traceability of grain from the paddock to the time that the grain leaves the property it is crucial that every silo or storage facility is identified in a clear and unambiguous way.

It is required that all silo and/or storage facilities be clearly identified by unique individual numbers physically written on, or attached to the door. (20)

Facilities used for the holding of grain, whether short or long term, must be weatherproof and in sound condition so as to minimise the potential for vermin damage. (21)

The contents of each silo or storage facility must be recorded and this includes grain insecticide applications. (22)

The information recorded on silo contents should include:

- Silo Number
- Date
- Crop type
- Paddock
- Tonnage in and out
- Moisture
- Insecticide applied and rate

This information should be kept in a safe but handy place for quick reference when required.

Regular checks should be made on the condition of grain or seed while in long-term storage. (23)

It is recommended that grain aeration be used for long-term storage. For further recommendations on storage of grain on farms refer to the relevant sections of the Post Harvest Grain Management poster and to "The Drying and Storage of Grain and Herbage Seeds"

20.	Facilities are clearly and uniquely identified.	C
21.	Storage facilities used for the holding of grain are and in sound condition and remain weatherproof.	M
22.	The contents of all silos or other storage facilities are recorded and include grain insecticide applications. <ul style="list-style-type: none"> • Silo content records • Grain Insecticide records 	C
23.	Regular checks are made on the grain to ensure vermin and pest free and in sound condition.	M

Transportation of Grain

Transport equipment has the potential to cause cross contamination issues following carriage of ruminant proteins, fertiliser, soil etc. Previous loads in trucks/trailers should be thoroughly cleaned out prior to loading. (24)

Before loading commences, records should be checked and transport operator confirms correct line information to ensure that the correct grain type is actually loaded. (25)

Use of delivery notes is recommended for all consignments leaving the farm. Delivery notes should include details: (26)

- Crop type
- Date
- Destination
- Weight
- Haulage contractor
- Silo number
- Post harvest chemical applications
- Previous load carted

24.	Trucks, trailers and augers are clear and free of contamination from previous loads.	M
25.	Before loading commences, records should be checked and transport operator confirms correct line information to ensure that the correct grain type is actually loaded.	C
26.	Delivery note used.	R

Records

Following is a summary of the records that are required to be kept to adhere to the conditions of the scheme. Members are not required to keep these records individually, and may choose to combine any records as best suits their recording system.

Some example records are included in Appendix 1.

RECORD	REF.	CAT.	REFERENCE MATERIAL
Farm map	1.	C	
Sowing records	3.	C	
Fertiliser application records	5.	C	Code of Practice for Fertiliser Use
Chemical application records	8.	R	Code of Practice for the Management of Agrichemical
Pre harvest storage Insecticide records	13.	C	Post Harvest Grain Management Poster & "The Drying and Storage of Grain and Herbage Seeds"
Silo content records	18. 22.	C	
Grain insecticide records	22.	C	
Delivery Notes	26.	R	

Glossary

A **Line** of grain referred to in the Grower Manual is a parcel of grain of the same cultivar, of uniform specifications that is marketed by an organisation.

Appendix 1: Example Records

The object of the grower audit is to obtain or sight evidence and evaluate it objectively to determine the extent to which certain criteria are fulfilled. This would therefore involve sighting records kept by the grower to verify all crop related activities from purchase to selling. The second part of the audit would be to observe or outline methods and procedures when handling or storing grain.

The exact format and methods employed by growers when keeping crop records is entirely dependent on each growers individual preference. This will be considered and evaluated by the auditor on a case-by-case basis with each grower.

The following are examples of paddock and silo records that could be sighted at an audit to verify actions taken:

Paddock Record

(incorporating sowing, fertiliser, chemical & grain insecticide records)

Paddock A 9.6 Ha

Consort - local feed contract

2/05/02	80kg/ha Consort Wheat-Gauche treated (1G ref 200123556) 150kg/ha DAP	27
28/08/02	15g/ha Glean 300ml/ha Cougar 20ml/ha Karate	
5/10/02	1.5l/ha Cycocel 250ml/ha Opus	
23/10/02	2.5l/ha MCPA (some fumitory) 100ml/ha Topik 500ml/ha Fortune	
25/10/02	200kg/ha Urea	92
4/11/02	400ml/ha Allegro	
11/11/02	200kg/ha Urea	92
2/12/02	250ml/ha Opus 250ml/ha Amistar	
18/12/02	250ml/ha Opus 250ml/ha Amistar	211kg N
13/02/03	3l/ha Roundup	
20/02/03	Harvest 91 tonne to silo J1, 14.8% moisture, 20 degrees no Actellic	

Silo Content Records

(incorporating silo content, pre harvest insecticide and grain insecticide records)

Alternative 1.

Using a notebook page for each silo, record all activities.

Silo Record J1

15/01/03	Cleaned silo, sound mjb Sprayed Actellic liquid	
20/02/03	91 tonne Consort Wheat ex paddock A 14.8% moisture, 20 degrees (no Actellic) -sample sent & kept ref con1	NEEDS DRYING
31/03/03	91 tonne transferred to D1 Dryer	

Silo Record D1

15/01/03	Cleaned silo, greased unloader Sprayed Actellic liquid
20/01/03	10 tonne Nui Ryegrass ex paddock L 14% moisture
25/01/03	10 tonne Nui delivered to Seed Cleaner 12%
26/01/03	Cleaned silo
31/03/03	91 tonne Consort ex J1 (paddock A) 14.8% to dry (no Actellic)
14/04/03	delivered to mill, 3 units

Alternative 2.

Using a spreadsheet (Accounts Book), list all activities in each silo.

	<i>J1(V bottom)</i>	<i>D1 (dryer)</i>
<i>15/01/03</i>	<i>Cleaned all silos, sprayed Actellic liquid, mjb</i>	
<i>20/01/03</i>		<i>10 t Nui ex pdk L 14%</i>
<i>25/01/03</i>		<i>deliver to Seed cleaner – 12% 1 unit</i>
<i>26/01/03</i>		<i>Cleaned – Bal 0</i>
<i>20/02/02</i>	<i>91 t Consort ex pdk A -14.8%, 20 deg (no Actellic)</i>	
<i>31/03/03</i>	<i>transfer to D1 cleaned Balance 0</i>	<i>91 t Consort ex D1 (pdk A) (no Actellic)</i>
<i>14/04/03</i>		<i>delivered to mill -3 units Cleaned – Bal</i>

Appendix 2: Audit Checklist

	Criteria	Category	Y	N	Comments	Agreed Action
1.	A system is in place, where grain can be reliably traced back to the paddock where grown. <ul style="list-style-type: none"> • Farm map 	C				
2.	Seed sown can be identified and verified by bag label or by purchase invoice/receipt.	C				
3.	Record of all sowings is retained which includes fertiliser and chemicals used. <ul style="list-style-type: none"> • Sowing Record 	C				
4.	Growers sowing "farm-saved" seed can verify seed origin and history.	C				
5.	A system for recording all fertiliser and nutrient applications is in place. <ul style="list-style-type: none"> • Fertiliser Application Record 	C				
6.	Purchase or contractor invoices retained for inspection at audit.	R				
7.	Growers hold current GROWSAFE® certification or equivalent/supervision by certified person: <ul style="list-style-type: none"> • Sight and record current GROWSAFE® Introductory or Applied Certificate • Sight and record current GROWSAFE® Registered Chemical Applicators Certificate 	R				

Criteria	Category	Y	N	Comments	Agreed Action
8. Chemical Application diary or record is maintained. Minimum information recorded should include: <ul style="list-style-type: none"> • Paddock • Crop Type • Date Applied • Chemical Product Applied • Application • Water Rate (R) • Application Method • Name of Applicator 	C				
9. Purchase or contractor invoices retained for inspection at audit.	C				
10. Agrichemicals are kept in designated store and clearly identified.	M				
11. Storage facilities and harvesting equipment cleaned and fit for purpose before season start.	C				
12. Regular calibration of moisture meters.	R				
13. All pre-harvest insecticide treatments on silos or storage facilities are recorded. <ul style="list-style-type: none"> • Pre harvest storage insecticide records 	C				
14. A formal procedure to collect representative samples from incoming loads of grain is followed.	M				
15. Samples stored on farm are clearly identified, sealed to prevent tampering, and are stored in a safe, vermin and weatherproof area.	M				
16. Samples are kept for a minimum of three months after final delivery of the line of grain.	M				

Criteria	Category	Y	N	Comments	Agreed Action
17. Grain drying process is carried out ensuring that the crop integrity and quality of the grain is maintained at all times.	M				
18. Any grain movements during drying process are recorded. • Silo Content Record	C				
19. Samples are collected after drying process.	M				
20. Facilities are clearly and uniquely identified.	C				
21. Storage facilities used for the holding of grain are and in sound condition and remain weatherproof.	M				
22. The contents of all silos or other storage facilities are recorded and include grain insecticide applications. • Silo content records • Grain insecticide records	C				
23. Regular checks are made on the grain to ensure vermin and pest free in sound condition.	M				
24. Trucks, trailers and augers are clear and free of contamination from previous loads.	M				
25. Before loading commences, records should be checked and transport operator confirms correct line information to ensure that the correct grain type is actually loaded.	C				
26. Delivery note used.	R				

Agreed date for completion of corrective actions:	Signature Assessor:	Signature Grower:
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Further Information

For further information on organisations referred to in the Grower Manual, please contact the relevant body below:

Code of Practice for Fertiliser Use

Fertresearch
PO Box 9577
Newmarket
Auckland
Tel (09) 415 1357
Fax (09) 415 1359
Email fmra@xtra.co.nz
Internet www.fertresearch.org.nz

Code of Practice for the Management of Agrichemical (Growsafe®)

The Secretary
The New Zealand Agrichemical
Education Trust
PO Box 10232
Wellington
Tel (04) 472 9997
Fax (04) 472 9997
Internet www.growsafe.co.nz

Post Harvest Grain Management Poster

and

"The Drying and Storage of Grain and Herbage Seeds" - Edited by Murray Hill

Both available from:

Foundation for Arable Research
P.O. Box 80
Lincoln