

NVT PROTOCOLS





NVT PROTOCOLS



Version 1.8

Release – February 2024

Version Control Table

Version	Date	Description
Number		
1.8	07/02/24	1. 1.2.1 (b) updated – Removal of outdated TSP requirements at TSP
		Meeting.
		2. 1.4.4 added – Breeder requirement to nominate pre-commercial
		cultivars by 30 th October.
		1.5 updated – addition of 'Affiliated Personnel'.
		4. 1.5.7 updated – table now includes Authorised Representative for the
		Breeder column.
		5. 1.5.7* added – definition of Authorised Representative.
		6. 2.8.4 (b) added – seed quality information to be provided to TSP prior
		to delivery date. Assumption of 100% germination if no information
		7 - 284 (c) added TSP has right to remove variety from trial if seed is
		7. 2.8.4 (c) duded = 13F has light to remove vallety from that it seed is
		8 533 added – definition of 'Operational Filler'
		9 575 added - seed quality information to be provided to TSP prior to
		delivery date. Assumption of 100% germination if no information
		provided.
		10. 5.7.6 added – TSP has right to remove variety from trial if seed is late
		arriving.
		11. 5.17.5 updated – protocol for off label use of fungicides.
		12. 5.18.4 added – requirement of trial ratings by TSP uploaded into NVT
		database.
		13. 5.18.10 updated – correction to appendix reference.
		14. 5.18.12 (a) updated – plots only to be N/A for mechanical/operational reasons
		15. 5.18.13 added – If plot trimming required, all plots in range must be
		trimmed to same length.
		16. 5.21.3 (a) added – uploading temperature data at co-located sites.
		17. 7.1.3 updated – TSP to inform NVT manager prior to harvesting in sub-
		optimal conditions.
		18. 7.3.5 updated – TSP now covers cost of testing and freight for audit
		samples.
		19. 7.5.2 updated – Date changed to 21 st July.
		20. Appendix A.1 removed – TSP Data Entry Requirements 2025 21. Appendix A.3 removed – Milestones 2023
		22. Appendix A.5 removed – Key Performance Indicators 2023
		23. Appendix A. 5 removed – Rey renormance indicators 2025 23. Appendix B undated – TSP has right to sow without varieties if seed is
		delivered late.
		24. Appendix E updated – Breeders will have access to trial feedback and
		summary sheet, not individual audit files.
		25. Appendix F.4 updated – removal of 50% flowering measurement.
		26. Appendix F.4 updated – Lodging updated to include % severity.
		27. Appendix G.2 updated – removed duplicate row.
		28. Appendix H.2 updated – Nutrition updated to include term 'Available
		NILLOYELL. 29 Appendix H 3 updated - Pequired herbicide/insecticide/funcicide
		updated to include management of IMI series Lentil trials
		30. Appendix J.1 updated – formatting updated. Addition of Irrigated
		Canola sowing window NSW and VIC.
		31. Appendix J.2 updated – formatting updated. Addition of Irrigated
		Canola sowing window NSW and VIC.
		32. Appendix L added – Engagement with Breeding Companies on NVT
		Social Media.
		33. Appendix O updated – fence sign updated to Include new X logo.

	34. Appendix O.3 added – TSP's may add QR code sign in stickers to
	fence signs.
	35. Appendix O.4 added – no design changes to be made to fence signs unless approved by GRDC.

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1 GENERAL INFORMATION

1.1 GRDC NVT Management Team

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Mr. Ben O'Connor	NVT Operations Manager	ben.oconnor@grdc.com.au	<u>0499 887 749</u>
Mr. Trevor Garnett	NVT Manager – South	trevor.garnett@grdc.com.au	<u>0457 906 770</u>
Ms. Isabelle Rogers	NVT Manager – West	isabelle.rogers@grdc.com.au	<u>0451 937 420</u>
Mr. Laurie Fitzgerald	NVT Manager – North	laurie.fitzgerald@grdc.com.au	<u>0455 957 712</u>
Ms. Dianne Wright	NVT Contracts Admin	dianne.wright@grdc.com.au	<u>08 8198 8410</u>

For the purpose of this document, the terminology "NVT Manager" may refer to any one of the abovementioned NVT Management Team.

1.2 National NVT Management Committee

- (1) It is a requirement for all Trial Service Provider organisations to participate in the National NVT Management Committee. The National NVT Management Committee comprises:
 - (a) GRDC NVT Management Team.
 - (b) At least 1 delegate from each of the NVT Trial Service Providers (from 2024 this will be at least 1 delegate from each NVT Geographical region for which the Trial Service Provider is contracted.
- (2) The National NVT Management Committee meet once each year at a capital city vanue determined by the NVT Manager. The meeting is chaired by a GRDC NVT Manager or their nominee. The cost of travel and accommodation for Trial Service Provider delegates is covered by the Trial Service Provider and delegates are expected to attend in person.

1.3 Regional NVT Advisory Committees (NACs)

- (1) NVT Trial Service Providers are required to participate in the relevant regional NVT Advisory Committee to advise on trial locations, regional best practice, and support around agronomic expertise for trial execution.
- (2) NVT Trial Service Providers are required to present a summary of the environmental and management factors affecting trials and the actions taken to avoid these issues occurring in the future.
- (3) Trial Service Providers are required to meet their own costs for participating in NAC meetings.
- (4) The committees are to be comprised of both leading farmers and agronomists.
- (5) The committees' recommendations should be supplied to regional NVT Managers.
- (6) Trial Service Provider may use NAC members for advice or information on suitable trial locations, sowing opportunities, and season conditions in local areas.
- (7) The regional NVT Advisory Committee will not report to the Trial Service Provider, nor the Trial Service Provider report to the committee.

1.4 Breeders and Participating Companies

- (1) Any Breeder, Breeding Company, Seed Company or Identity wishing to submit material for NVT testing will be known as Breeder/s from this point forward in this document.
- (2) Breeders submitting material into NVT testing must be signatory to the NVT Breeder Participation Agreement.
- (3) GRDC/NVT assess all participating parties on a case-by-case basis to ensure they qualify for participation in NVT. GRDC reserve the right to decline Breeder participation.
- (4) Breeders will need to declare their intention to nominate pre-commercial cultivars by 30 October for Minor Crop Allocation crop types where they have not previously participated. Failure to do so will result in the relevant pre-commercial purchase price being applied to their entries.

1.5 Access to the NVT Database & Affiliated Personnel

- To be considered a Participating Breeder, the Breeder must have an active NVT Participation Agreement, and be submitting lines for testing into NVT in the current season.
- (2) The signatory for the Participating Breeder will be provided Breeder level access to the database.
- (3) The Participating Breeder can provide:
 - (a) a list of Affiliated Personnel who will be given the same database access rights as the Participating Breeder.
 - (b) A list of Affiliated Personnel to be granted "Advanced User" access. See table below for "Advanced User" access rights
- (4) The Affiliated Personnel list will be maintained in an NVT register.
- (5) The Participating Breeder will be required to ensure that all Affiliated Personnel are abiding by all NVT data terms of use covered by the NVT Breeder Participation Agreement and the protocols.
- (6) The Participating Breeder will be responsible for ensuring the register of Affiliated Personnel is up to date and maintained at all times (ie staff leaving, changes to business arrangements with 3rd company providers etc).
- (7)

			Affiliated Person - Advanced	Authorised Representative for the
	Public	Affiliated Person	User	Breeder*
		Person	The	Company
		nominated by a	Participating	Signatory with
		Participating	Breeder	a current NVT
		Company	Signatory can	Participation
		Signatory (can be	assign	Agreement
		from the same	themselves,	(PA), can
		company or 3 rd	and Affiliated	nominate
Activity		party	Personnel, as	authorised

		organisations working with the Participating breeder)	"Advanced Users for additional access rights to the NVT database.	personnel to receive data under their PA.
Access to published trial results (NVT website, single site trial reports, LTRY, Harvest Reports, pathology results)	✓ 	✓ 	√ 	√
Access to NVT trial sites and provide trial feedback	\checkmark	~	✓ 	✓
Ability to provide feedback on NVT Protocols	\checkmark	\checkmark	\checkmark	✓
Access to mud maps and GPS locations (received directly from NVT)	x	✓	\checkmark	\checkmark
Participate in operational and strategic NVT meetings (pre- season meeting, pre-harvest meeting)	×	~	√	√
Access to NVT database, raw data, unrelease varieties and pathology results for trials where the breeder is participating.	X	\checkmark		√
Nominate varieties into NVT trials via the online database portal and commit to any costs associated with entry in those trials.	x	x	✓	X
Edit cultivar information and flag a cultivar as "released"	Х	x	V	X

Ability to	Х	Х	Х	\checkmark
nominate				
Affiliated				
Persons &				
Advanced Users				

*A duly authorised person that is signaturoy to either the NVT Particpation Agreement or the Affiliated Personnel Nomination Form.

(8) All Affiliate Personnel (including advanced users) will be revoked annually on June 30th each year, Breeders will be required to supply an updated Affiliate Personnel List prior to June 30th each year to be implemented on July 1st.

2 ENTRY REQUIREMENTS

2.1 NVT Cultivar Nomination and Acceptance Criteria

- (1) Breeders are invited to nominate varieties for inclusion in the NVT program in accordance with the terms of the NVT Protocols and Breeder Participation Agreement.
- (2) Nominated lines must have adaptation in nominated regions and have the potential to fulfill a grower's requirements in their farming system.
- (3) Breeders are required to identify the maturity class of each entry based on the days from sowing to 50% flowering, referenced against the Goal Post Varieties as listed in APPENDIX I – GOAL POST VARIETIES (MATURITY WINDOWS). Companies must notify the NVT Manager if their cultivar differs significantly from designated maturity classes as defined in the APPENDIX I – GOAL POST VARIETIES (MATURITY WINDOWS)..
- (4) Varieties entered in to NVT trials may be required to meet specific disease pathotype resistance requirements of a targeted region
- (5) Breeders may be required to provide information regarding their nominations and how their entries may differ from the accepted range of varieties in any trial series. This applies to trial management factors such as seedling vigour, tillering ability and harvest sensitivity.
- (6) The onus is on the Breeders to ensure the suitability of varieties within the nominated NVT region and trial series refer to APPENDIX I GOAL POST VARIETIES (MATURITY WINDOWS). GRDC may provide feedback to Breeders regarding the suitability of nominated varieties, however, the responsibility of suitability of material is that of the Breeder.
- (7) GRDC reserves the right to remove any pre-commercial Line from a trial if it is determined by GRDC that the pre-commercial Line was nominated in an unsuitable trial.

2.2 Nominating Lines

- (1) Breeders must submit the names of pre-commercial Line entries to the NVT Manager by the nomination date specified in APPENDIX B – NVT NOMINATION AND SEED DELIVERY DATES. This will allow the NVT team to compile regional seeding lists.
- (2) Each cultivar must be nominated in all trials within an NVT region, or as directed in the NVT nomination information.
- (3) A fee payable by the Breeder will be applied for the inclusion for eligible Breeder Lines in the NVT Program (**Pre-commercial Line Fee**). See Schedule C of the NVT Breeder Participation Agreement. Information regarding the Pre-commercial Line Fee, applicable varieties/Lines and relevant information will be provided by the NVT team at the time that invitations for nominations open.

- (4) Any seed remaining after NVT trial requirements have been met must either be returned to the breeder (if requested) or destroyed by confounding into a common container and delivered for rubbish disposal.
- (5) A chain of custody must be adhered to at all points of transfer and be available for scrutiny upon request by authorized representatives of the NVT program. All details declared by the Breeder relating to seed must be accurate and reflective of seed quality at time of delivery to TSP, including, but not limited to germination % and seed weight (1000 seed weight).
- (6) Each cultivar must have a unique name/number when nominated to NVT. Varieties will be assigned a unique CultivarID in the NVT system that is fixed to that genetic material.
 - (a) A Breeder must not nominate the same genetic material (cultivar) under different names and/or test codes.
 - (b) Name changes to cultivars are permitted, but unique genetic materials must remain fixed to their specific and unique CultivarID in the NVT system.
 - (i) Breeders are required to notify NVT whenever a name change occurs
 - (ii) This includes slight changes to names such as prefixes, suffixes, and spelling

2.3 Pricing

- (1) In accordance with the terms of the NVT Breeder Participation Agreement, information about the Pre-commercial Line Fees (including the Fees payable) will be provided to Breeders annually at the time when Breeders are invited to nominate pre-commercial Lines for entry in NVT.
- (2) If the Breeder wishes to nominate any pre-commercial Line for participation in the NVT Program, then the Breeder must pay the applicable Pre-commercial Line Fee in accordance with Schedule C of the NVT Breeder Participation Agreement.
- (3) The Pre-commercial Line Fee is inclusive of the risk associated with trial failure. The risk of trial failure is off-set by a discount being applied in the Pre-commercial Line Fees. To the extent permitted by law, a refund to Breeders will not be provided in the event a trial fails.

2.4 Commercial vs Released Varieties, Commercialisation Process and Commercialisation Credits

- (1) The following terms are used by the NVT program to describe cultivars at varying stages of development:
 - (a) Pre-commercial cultivar is being developed by a breeder and is not available to Australian Grain Growers.
 - (b) Commercial cultivar is available to Australian Grain Growers to purchase and grow in the current season.
 - (c) Unreleased cultivar does not have NVT data publicly available.
 - (d) Released cultivar has NVT data publicly available. Note that not all released cultivars will be commercially available, breeders may choose to release NVT data on parent lines or other pre-commercial cultivars.
- (2) Commercial Varieties:
 - (a) All trialing costs of Commercial cultivars will be paid for by GRDC on behalf of Australian Growers.

- (b) Commercial Varieties included in the NVT Program will be reviewed annually through consultation with participating Breeders, NVT Advisory Committees and industry.
- (c) A Notice of Commercialisation (APPENDIX M NOTICE OF COMMERCIALISATION) 121 form is required to be submitted if a breeder enters a Commercial Cultivar that has not been trialed as a pre-commercial line, declaring that the cultivar is available to Australian grain growers to purchase seed and grow commercially in the current season.
- (3) Released Varieties:
 - (a) If a Breeder initiates the use of a "commercial name" for a cultivar for the purposes of industry promotion via any sources or format of promotional media, the cultivar will be Released and the NVT data will be made public as the cultivar is now a Commercial Cultivar.
 - (b) Data from Unreleased cultivars in the NVT systems remains confidential and cannot be published or distributed.
 - (i) This applies to all lines, including a Breeder's own material, as there is no opportunity for claims to be cross-checked, ratified, or publicly verified by the general public, GRDC, or other participating companies.
 - (A) A Breeder can choose to authorize NVT to publish data publicly (release) on the NVT website, with or without actual commercialization of the cultivar, if they wish to publish NVT results on the cultivar
 - (ii) Breeders will have 2 years of visibility of all cultivar results for the specific crop and the specific trials that they have lines actively nominated for.
- (4) Cultivar Commercialisation process
 - (a) To facilitate publication of data for commercialised cultivars, breeders must officially notify the NVT Manager of the commercialisation of a cultivar within 2 business days of commercialisation.
 - (i) A cultivar will be considered Commercialised and subsequently Released when the variety owner or initiates the use of the "commercial name" for the new cultivar for the purposes of industry promotion via any sources or format of promotional media.
 - (b) Upon commercialization, Breeders must also provide a succinct cultivar summary paragraph covering the following points:
 - (i) Commercial Name
 - (ii) Cultivar maturity (i.e. early-mid, etc.).
 - (iii) Preferred growing regions. Plant physiological traits (i.e. height, growth habit).
 - (iv) Potential cultivar replacement.
 - (v) Comment on grain quality or cultivar classification.
 - (vi) End Point Royalty rate (\$).
 - (vii) Commercialisation partner or seed distributor.

This summary information may be published in NVT sowing guides, harvest reports, and on the NVT website to give users additional information on traits and characteristics not specifically measured in NVT. Cultivar summaries should not reference yield potential, nor should they list competitors' varieties as replacement options. GRDC may edit this information to ensure it is fit for purpose.

(c) Once notification is received:

- (i) The NVT database will be updated to record and show the commercial name of the cultivar.
- (ii) The cultivar will be flagged as "released" and will appear in NVT online public reports within 48 hours.
- (d) To ensure NVT printed publications (such as annual Harvest Reports) have the most up-to date information, Breeders are required to confirm the release for a cultivar and supply information to NVT by the closing date and time of the MET preliminary file review period as set by the NVT Manager for inclusion into reports.
 - (i) Note Breeders should advise the NVT manager which specific Harvest Reports the cultivar should be included in, if this differs from the regions where it was trialed.
- (5) Commercialisation Credits
 - (a) GRDC will issue Commercialisations Credits to reimburse Breeders for entry costs of pre-commercial Lines for the final 2 years of pre-commercial NVT testing.
 - (b) Commercialisation Credit is issued when a pre-commercial Line is made available to Australian grain growers for the purpose of purchasing seed to grow commercially in the current season.
 - (c) The credit will take the form of a free pre-commercial entry in the following seasons trials of the same crop group per commercially-released line..
 - (d) To be eligible for a Commercialisation Credit:
 - (i) The cultivar must be named and is being actively promoted to growers
 - (ii) An authorized person has submitted a signed Notice of Commercialisation form declaring that the cultivar is available to Australian grain growers to purchase seed and grow commercially in the current season, authorizing NVT to make results publicly available online
 - (A) The breeder undertakes to supply Seed to NVT seed bulk up program (Excluding Canola & Sorghum) by the date listed in the APPENDIX B NVT NOMINATION AND SEED DELIVERY DATES in the NVT protocols.

2.5 Breeder Data Access

- (1) Breeders who are party to a NVT Breeder Participation Agreement will have access to NVT data and information that is not otherwise available to the public.
- (2) A Breeder will only be granted access to data that relates to the crop type and cultivars of which have been entered by that Breeder in NVT.
- (3) Following harvest Breeders with pre-commercial entries in NVT can access & use NVT Trial Data under the terms of the Participating Breeder NVT Data licence Agreement.
- (4) Breeders will be able to use Trial Data for internal analysis and breeding decision making. The use of Trial Data is for internal Breeder use and not for external publication.

2.6 **De-identified Varieties**

- (1) Breeders may request the de-identification of pre-commercial Lines that are more than two years from Commercial Cultivar Release.
- (2) De-identified pre-commercial Lines will be assigned a cultivar code known only to the Breeder and NVT.

- (3) De-identified pre-commercial Lines will not be eligible for a Commercialisation Credit in the years when the cultivar is de-identified.
- (4) De-identified Lines will not be eligible for pathology or grain quality testing in the years when the Line is de-identified.

2.7 Seed Supply (General)

- (1) Accurate germination percentage and seed size (1000 grain weight) for each line will be supplied to the Trial Service Provider on the Chain of Custody (CoC) documentation to calculate seed packing weights.
 - (a) The Trial Service Providers will use this information to calculate the amount of seed of each line required per plot to achieve the target plant establishment rate indicated in the Crop Specific Protocols found in the appendices of the Protocols.
 - (b) To calculate amount of seed required: Target population per m² x thousand grain weight, divided by actual cultivar germination x target establishment (= this then needs to be multiplied by the sown plot area. Example calculation is provided below:



- (2) Bare seed will be supplied. If this is not the case, it is essential to notify the NVT Manager to decide the appropriate course of action.
- (3) The Trial Service Provider will be required to treat the seed with the appropriate seed dressing (APPENDIX H CROP SPECIFIC PROTOCOLS).
- (4) The Trial Service Provider must have operating systems in place to ensure that seed is accurately identified throughout this process.
- (5) It will be the responsibility of the Trial Service Provider to ensure the seed is placed into packets or magazines appropriate for their sowing system.
- (6) Seed of all lines and varieties in each trial must be treated in exactly the same manner.
- (7) A 50g sample of each line of seed supplied by the breeder and commercial lines supplied by GRDC seed bulk up program must be retained and securely labelled by the Trial Service Provider for germination testing if required post NVT emergence, or in case there is any dispute over the genetic identity of plots sown.
- (8) This sowing reference sample must be stored in a cool dry place for two years following the sowing period.

2.8 Breeder Supplied Seed (General)

- (1) To participate, Breeders will supply seed to NVT when the cultivar is:
 - (a) A Hybrid, or
 - (b) Any Canola cultivar, or
 - (c) A pre-commercial/unreleased line, or
 - (d) A cultivar in it's first year of commercialisation (Noting in this scenario seed must be provided to both the NVT TSP and the NVT Seed-Bulk Up Provider).
- (2) The Breeder must supply seed of a quality that enables those lines to perform to their full genetic potential.
- (3) The Breeder must supply bare seed (no seed treatment) unless prior approval to send treated seed has been sought from the NVT Manager.
- (4) The Breeder is also required to provide Trial Service Providers with accurate information on germination percentage and seed size (1000 grain weight) for each nominated line on the Chain of Custody (CoC) documentation. It is the Breeders responsibility to ensure accuracy of details provided.
 - (a) Seed quality audits will be conducted by GRDC to ensure the accuracy of the information provided in the Chain of Custody. Cultivars will be removed from the program, if inaccurate CoC information results in incorrect seeding rates and plant populations. Breeders may be liable for Removed Entry associated costs if this occurs, as described in the *NVT Breeder Participation Agreement*.
 - (b) Accurate seed quality information needs to be provided to the TSP on or before the Delivery date as specified in APPENDIX B – NVT NOMINATION AND SEED DELIVERY DATES. In the event no seed quality information is received the TSP will assume a germination percentage of 100% and a seed weight based on the average of all varieties in that trial.
 - (c) TSP has the right to remove a variety if seed delivery is late. APPENDIX B NVT NOMINATION AND SEED DELIVERY DATES. The Breeder will be made aware of removed variety.
- (5) If the Breeder is aware that their lines have particular traits that may affect their performance in the trial (e.g. short plant structure, prone to lodging, develops brittle stems post physiological maturity) the Breeder is required to notify NVT Management during nomination. The breeder should also provide additional seed to the TSPs for sowing additional buffer plots for harvester set up.
- (6) The Breeder must provide seed that is weed and disease free. Seed that is dirty or contaminated will not be included in NVT.
- (7) For the purposes of biosecurity, contamination risks of seed include soil, live insects/snails, seed species that have been assessed as a weed risk, unidentified seeds, fungal mycelium (sclerotia), animal faecal matter and plant material.
- (8) Seed should be free of soil. Soil is not always readily visible, but 0.1% has been adopted as the standard maximum tolerance above this level the seed must be cleaned or disposed of.
- (9) Each breeder will advise the NVT Manager of its preferred method of excess seed disposal. The NVT Manager will provide this information direct to the Trial Service Provider. It may be that seed either be returned to the breeder if requested or destroyed by confounding into a common container and delivered for rubbish disposal. Excess seed is not to be sown or used as stock feed.

- (10) Trial Service Providers must comply with each Breeders preferred method of seed disposal and keep records to confirm that they have employed the preferred method identified by each breeder.
- (11) Seed of entries accepted into the NVT program must be delivered to the Trial Service Providers designated location for seed receival by the delivery date specified in APPENDIX B – NVT NOMINATION AND SEED DELIVERY DATES. This timeframe is designed to allow time for redistribution, packing and preparation as the germination window opens.
- (12) Seed must be supplied in robust packaging. Paper packaging or envelopes are to be avoided as they can be damaged in transit or handling.

2.9 Breeder Supplied Seed (Genetically Modified Requirements)

- (1) Genetically Modified Cultivars
 - (a) Designated GM lines are admissible for testing in NVT subject to;
 - (i) the Acceptance Criteria being fulfilled; and
 - (ii) That Governing State and Commonwealth laws, at the time of first nomination, permit the commercial release of the nominated line to growers.
 - (b) Seed Providers are required to obtain all necessary documentation and permits in compliance with governing State and Commonwealth law prior to nominating GM entries for NVT.
- (2) Non GM Cultivars
 - (a) When non-GM lines are supplied to NVT, the Seed Provider must take all reasonable precautions to guarantee the genetic purity of the provided seed in order to avoid any unintentional release of GM material.
 - (b) Adventitious Presence of GM Material (AP).
 - (i) State moratoria have accepted harvested seed to contain no more than 0.9% of AP in harvested grain and for sowing seed to contain no more than 0.5% of AP.
 - (ii) For canola, seed companies must provide declaration that AP testing for GM material has been conducted, and the detected limits are below GM thresholds relevant for each state.

2.10 NVT Supplied Seed

- (1) Commercial entries a common seed source is used for all commercial varieties within each trial. Seed will be supplied in bulk to the Trial Service Provider for sowing.
- (2) Additional supply of a specified cultivar can be supplied for use in situations where a filler is required.

2.11 Material Transfer Agreement

- (1) All non-commercial seed material must be protected under a Material Transfer Agreement (MTA) between the Breeder supplying/distributing the seed for the purpose of NVT, and the Trial Service Provider (receiver) for the seed allotment.
- (2) GRDC will provide NVT minimum terms that must be included as clauses within each MTA. These clauses are provided in APPENDIX D – MATERIAL TRANSFER AGREEMENT.

- (3) Breeder participants may include additional clauses within the MTA by negotiation, as long as GRDC's specified minimum terms are not contradicted.
- (4) Breeders are to execute an MTA with each Trial Service Provider receiving their seed/IP prior to the seed delivery date.
- (5) MTAs are valid for the term of the NVT Trial Service Provider contract period.
- (6) The TSP will be responsible for collating and recording all required MTA documents. Once collated, or when requested by the NVT Manager, the TSP will provide the NVT Manager with a copy of all executed MTAs in a single email confirming that all MTAs are accounted for and attached.
- (7) Should the supply of a fully executed MTA be delayed beyond Milestone 1 date, the TSP should advise the NVT Manager in advance.

2.12 Chain of Custody

- (1) The Trial Service Provider is required to maintain and retain all documentation showing the full process of acquisition, transfer, handling and disposal of all physical or electronic materials.
- (2) Chain of Custody form to be used in attached APPENDIX C CHAIN OF CUSTODY FORM, an excel template is available from NVT.
- (3) The TSP will be responsible for collating and recording all required CoC documents. Once collated the TSP will provide the NVT Manager with a copy of all executed CoCs in a single email confirming that all CoCs are accounted for and attached.

2.13 NVT Disease Ratings

- (1) Varieties included in the NVT yield program will be eligible for inclusion in the NVT disease ratings program with the following conditions.
 - (a) Varieties are accepted into the NVT disease ratings program on a crop by disease basis.
 - (b) Each crop by disease combination accepts varieties based on their length of participation in the NVT program;
 - (i) Commercial cultivar ("Commercial")
 - (ii) Recently commercialised cultivar ("Commercial First")
 - (iii) Existing pre-commercial cultivar within one year of commercial release (NVT Retention, NVT -1).
 - (iv) Pre-commercial cultivar within two years of commercial release (NVT First, NVT -2), or
 - (v) Specific cultivar list as identified by the NVT manager or pathologist.
- (2) APPENDIX L NVT DISEASE RATINGS CROP BY DISEASE COMBINATIONS outlines which cultivar type will be accepted for each crop by disease combination.
- (3) GRDC reserves the right to change the eligibility of cultivar inclusion in the NVT disease ratings and the crop by disease combinations.

3 SITE SELECTION, PREPARATION AND PROFILING

3.1 Co-operator Agreement

- (1) For each NVT site, where the trial site is on land belonging to a farmer or other third party, a written agreement must be prepared and signed by both the farmer and the Trial Service Provider to ensure clarity of arrangement for the trial site for any one year.
- (2) If NVT trials are hosted by the same cooperator for multiple years, one agreement can be signed for the length of the current NVT contract period.
- (3) Trial Service Providers will use their own template; however, this agreement must be made available to the NVT Manager when requested.
- (4) The Co-operator Agreement should include at a minimum, but not limited to, the following points;
 - (a) Ensure the co-operator agrees for the Service Provider to meet obligations to provide all data required for the NVT program (including data listed in APPENDIX A – DATA ENTRY, MILESTONES, KPI)
 - (b) Ensured access to the trial site for personnel approved by the Service Provider and/or the NVT Manager.
 - (c) The co-operator grants permission to the Trial Service Provider, GRDC staff, NVT Participating Breeders, and third-party researchers approved by the NVT Manager to fly Unmanned Aerial Vehicles (UAV/drones) over the NVT site to gather relevant images and data.
 - (d) The publication of data collected from the Site, including but not limited to yield data, soil test results, Predicta B results, rainfall and weather.
 - (e) The publication of co-operator details in NVT and GRDC publications (e.g. NVT Harvest Reports).

3.2 Co-Location of trials with NVT's

- (1) Non-NVT trials can be co-located at an NVT trial site at the discretion of the NVT TSP.
- (2) When co-locating other trials at NVT sites the following should be considered:
 - (a) The NVT should be spatially distanced and clearly defined from other co-located trials. There should be no confusion about which trial is NVT.
 - (b) NVT signage should be prominent and separate from other trial signage to avoid confusion to the public.
 - (c) Management of the NVT should not be compromised. Timing of spraying, sowing, harvest etc, should be optimised for the best outcome for NVT.
 - (d) The NVT should not be co-located with any trials that present a risk to NVT delivery.
 - (e) In trial sites with multiple co-located NVT trials, there needs to be an NVT sign with QR code on each crop type. A single QR code can be re-used for all trials at the site
 - (f) Where lentil and other pulse trials are co-located, if possible, the trials should be located in a lentil paddock.

3.3 Site Selection

- (1) Sites should be within 25 km radius of the allocated site name unless otherwise approved by NVT Manager.
- (2) Sites must be accessible for trial operators, breeders, field day personnel and attendees, and others who need to look at the trials. Sites must also be accessible for third party researchers to collect and remove samples from trials for research purposes approved by the NVT Manager. Visibility for local farmers is encouraged, however not at the expense of uniformity and relevance. Consequently, sites should be as near as practical to access roads but not be compromised by machinery turning areas, drainage lines or tree lines.
- (3) It is recommended that the paddock be in the same phase of the local best practice rotation, as the crop(s) to be trialed.
- (4) A trial area must not be compromised by weed, disease or pest competition. This may require a higher level of weed, disease and pest management than the level considered acceptable to the landholder for the surrounding crop.
- (5) In frost prone districts, avoid low paddock elevation if possible.
- (6) Avoid areas where the use of UAVs is restricted, i.e., close to airports/airstrips, power lines, buildings etc.
- (7) NVT sites co-locating with local grower groups & field day locations is encouraged provided all site selection rules are adhered to. TSP's should work with the local grower group to ensure they are aware of NVT requirements and to assist in site selction for future years. Suitable site selection and trial quality takes priority over co-location with grower groups, and it is the TSP's responsibility to ensure quality trials are delivered. To that end NVT will always support the decision of the TSP in site selction.

3.4 Site Accessibility

- (1) Sites should be as near as practical to access roads, whether that be main council roads or internal farm tracks, however not at the expense of uniformity and relevance.
- (2) All trials are to be readily accessible by 2WD vehicle.
- (3) All trials must have the potential to be a field day site.
- (4) All trial sites should enable visibility and access to local farmers, advisors, third party researchers (which may consist of research organisations and Government departments and agencies) and other NVT stakeholders including Breeders representatives.
- (5) All sites should have an access/walking track with crop cut low to allow easy access and visibility.
- (6) Be aware that wet conditions may block some access roads. Try to choose sites with allweather access.
- (7) Biosecurity and general site hygiene practices must be adhered to.
- (8) All site visitors must contact the nominated Trial Service Provider, and grower cooperator/landowner for permission to access the trial site. Permission may not be granted automatically by the Trial Service Provider.
- (9) Any organization or individual wishing to access an NVT site for the purpose of taking measurements or samples must do so in line with the <u>NVT Resource Sharing Key</u> <u>Requirements</u> and only after receiving all appropriate authorisations.

3.5 Site Uniformity

- (1) The soil type of the selected site must be representative of the major cropping soil type in the district.
- (2) The site must be visually and physically uniform in soil type and soil profile.
- (3) The site must not be subject to excessive drainage from surrounding areas or at risk of flooding and be large enough to allow for machines to turn within any proposed fence line.
- (4) The site must be free of any possible complications from the past practices or uses (leveling, compactions, wheel tracks, fertiliser rate, soil emolliate, livestock activity) or the proposed use during the NVT trial season.
- (5) Residual of soil active herbicides must also be assessed and managed to avoid impact on the trial.
- (6) Crop residue from previous crops must be evenly distributed across the trial site, including header trails, chaff rows etc.
- (7) Where heavy stubble burdens, header tails, chaff rows etc, may jeopardize the establishment of a trial, crop residue must be managed or removed by raking, burning or other means necessary.

3.6 Paddock Rotation History

- (1) The paddock history over the last 3 years is to be recorded. This should include:
 - (a) The crop type/s grown.
 - (b) Herbicide rates.
 - (c) Residue risk (must be compliant with all plant back timeframes and seasonal requirements over 3 years).
- (2) All data is to be entered onto the GRDC NVT database as required by APPENDIX A DATA ENTRY, MILESTONES, KPI.

3.7 Herbicide use and Future Cropping Rotation

- (1) Consideration of the Host's future cropping rotation is required when deciding on herbicide use on NVT trials to ensure that future crops are not adversely affected.
- (2) Should long residual herbicides be used on the NVT trials it is recommended that the host be informed in writing as to the herbicide applied, the rate and date of application to avoid conflicts.

3.8 Soil Testing Nutrition

- (1) The cost of soil testing is to be covered by the Trial Service Provider.
- (2) Soil testing (including Predicta B) should be carried out well prior to seeding to allow returned results to fine tune site selection from high levels of root disease and professional nutrient management.
- (3) Nutrition testing depths and sampling process.
 - (a) As per APPENDIX F STANDARD OPERATING PROCEDURES.

- (4) Production targets.
 - (a) Yield target is to be the highest level expected for the site given the likely season.
 - (b) Nutrient applications should be targeted at levels so that the yields of the best performing lines in the trial are not limited.
- (5) To meet nutritional requirements, it may require pre-sowing application of fertilizer as well as starter fertilizer at sowing as determined by soil tests and regional best practice.
- (6) Soil cores across the site can be bulked into desired depths. (Minimum of 3 cores per range)
- (7) All test results are to be entered on the NVT database required by APPENDIX A DATA ENTRY, MILESTONES, KPI

3.9 Predicta B Testing

- (1) The cost of Predicta B testing at the lab is covered by GRDC/NVT. Trial Service Providers must cover the sampling and shipping costs.
- (2) Predicta B sampling and testing must occur at all NVT sites.
- (3) The Predicta B sample barcode number must be recorded and uploaded to the corresponding trial on the NVT database.
- (4) In the NVT system, the aim of the Predicta B sampling and testing is to identify risk of soil borne disease impacting trial results and cultivar performance, and to provide a deeper insight into crop health and yield performance.
 - (a) It may also allow trial managers to identify potentially problematic sites which would therefore not suitable for NVT trails. The results may also provide some data for the genotype responses in NVT trials.
- (5) A detailed description of the sampling method required can be found in APPENDIX F STANDARD OPERATING PROCEDURES

4 BIOSECURITY

4.1 Biosecurity for Visitors and Vehicles

- (1) It is the repsonsiblility of the Trial Manager and to work with the trial Co-operator to minimse any potential biosecurity risks and ensure the continued delivery of successful NVT trials.
 - (a) The NVT Manager, Trial Manager, and/or Trial Co-operator reserves the right to refuse entry to the NVT site due to biosecurity concerns.
- (2) Farm biosecurity plans must be respected and adhered to at all times. It is the Trial Service Provider's responsibility to monitor adherence and report any breaches to the co-operator and NVT manager.
- (3) In the absence of a farm biosecurity plan, Trial Service Providers must comply with Grower/Landholder requirements. This may include:
 - (a) Notify the Co-operator before entry to the farm.
 - (b) Ask Co-operator about weeds, plant pests, or restricted areas on the farm.
 - (c) Machinery, vehicles, and equipment are thoroughly inspected for insects, soil and plant material prior to arriving and when entering the property.

- (d) Designated parking areas are used for all non-farm vehicles and equipment.
- (e) Movement of vehicles is kept to farm roads and laneways whenever possible.
- (f) Farm gates are closed after opening and passing through them.
- (g) Unfamiliar, unusual or new plant pests reported to farmer, Agriculture Department or Exotic Plant Pest Hotline. (1800 084 881)
- (h) Consideration could/should be given to erecting "Biosecurity signage" alongside the GRDC NVT sign at entry to the trial site (APPENDIX N – FENCE SIGNS) with consultation with the co-operator.

5 TRIAL DESIGN AND MANAGEMENT

5.1 Trial Series Definitions

- (1) Wheat Trial Series definitions.
 - (a) Wheat Trial Series types are defined by the species type, cultivar maturity group and the germination window.
 - (b) "Goal post varieties" of known maturity define the boundaries of maturity group for each trial series type (see APPENDIX I – GOAL POST VARIETIES (MATURITY WINDOWS).).
 - (i) Main series wheat trials quick through to slow spring wheats.
 - (ii) Early series wheat trials.
 - (A) nNSW/QLD slow spring wheats.
 - (B) Southern & Western regions mid-slow through to slow spring wheats and quick winter wheats.
 - (iii) Long series wheat trials very slow spring wheats and winter wheats.
 - (iv) Durum series trials Durum species.
- (2) Canola Trial series definitions.
 - (a) Canola trial series types are defined by the rainfall zone location of the trial. The canola series types have historically been named as "early" and "mid" series trials
 - (i) Low to medium rainfall (early series trials) typically include quick to medium maturing varieties.
 - (ii) Medium to high rainfall (mid series trials) typically include medium to slow maturing varieties.

5.2 Trial Design

- (1) Trial designs utilize the latest statistical methodology available and allow for site and subsequent across-site analysis by qualified NVT biometricians.
- (2) The NVT Manager will determine the list of entries for each trial after discussions with the breeders, the NVT Team, Trial Service Providers, and the regional NVT Advisory Committees.
 - (a) Once the list of entries is determined and entered into the NVT database by the NVT Manager, the Trial Service Provider will use the NVT database to determine the shape and layout of the trial and enter this information into the NVT database to obtain a trial design.

- (3) There will be sufficient commercial entries, or trial standard varieties, in each trial to allow growers to benchmark upcoming varieties relative to a well-known cultivar in any region.
- (4) There will be repeated entries from year to year to allow connectivity among trials. These numbers will be determined by the NVT Manager in consultation with the supporting Biometrician.
- (5) Plot length must have a minimum harvestable length of 6m and ideally a maximum of 10m (longer plots require an excessive amounts of seed). The ideal harvestable length is 10m.
- (6) Plot width must have a minimum width of 1.2m (outside row to outside row), ideally the maximum plot width should be 2.0m.
- (7) All plots at a site, including buffer plots, are to be the same width and length and have the same number of rows.
- (8) The inter-row and inter-plot distance must be consistent across all plots within a trial.
- (9) Inter-plot distance should be kept to a minimum in erect crop types, e.g. cereals, such that wheel tracks do not encroach adjoining plots and must be increased in crop types that spread or trail to improve ease of harvest e.g. peas and canola, (APPENDIX H – CROP SPECIFIC PROTOCOLS). Plants which are likely to/or have intertwined between plots, should be physically separated well prior to harvest, to avoid admixture and shattering issues likely at harvest
- (10) Trial pathways are to be straight, and plots are to be uniform.
- (11) Where trials are located on properties where the co-operator use Controlled Traffic management, pathway widths should be adjusted to ensure that compacted wheel tracks fall into the pathway rather than within the plots. Wider pathway widths need to be recorded and entered database (preferred), and/or recorded in detail on Mud Map to allow biometricians to spatially analyse the trials
- (12) Where header trails and/or chaff rows are present on the site, the site should be pegged, where possible, such that the concentrated crop residue lines and pathways coincide. This is to minimise the detrimental effects on crop establishment within plot.
- (13) Additional replicates of a cultivar may be used in the place of fillers if the same seed source, sowing rate and seed treatment is used.
- (14) The distance between trial plots is to be determined by the Trial Service Providers. It must remain consistent. Design must be either 3 or 6 ranges unless approved by the NVT Manager.
- (15) If co-location (for different crop species) is required, it is to be reported to the NVT Manager following sowing. When co-location of canola trials (different chemistry types) or chickpeas (Kabuli and Desi types) occurs, the distance between trials must be recorded and entered into the database (preferred), and/or detailed on the mud map. This is to allow biometricians to spatially analyse the trials.
- (16) Additional Buffer plots should be sown alongside trials of crop types that require extra harvester set up or there are particular lines that have unique harvest requirements (e.g. short plant statue, low seed head/pods etc.).

5.3 Fillers

- (1) The use of "fillers" is considered not ideal and only to be used when absolutely necessary.
- (2) Trials sown on 6 ranges require an even number of varieties. Trial Service Providers may add a single Filler cultivar to reach an even number.

- (3) Operational fillers are fillers that may be necessary as part of the trial for randomisation to fit on the TSP's preferred layout
 - (a) These are termed "Operational Fillers" which will not be reimbursed by NVT but be a TSP cost.
 - (b) NVT will still reimburse TSP for the cost of other fillers that occur due to:
 - i. Removed Entries
 - ii. Missing Plot
- (4) Trials sown on 3 ranges do not require the use of Filler varieties when designs are first generated.
- (5) Fillers should only be added after consultation with the NVT manager under the following conditions:
 - (a) Fillers must be a commonly grown commercial cultivar and be an existing entry to the trial. NVT will supply additional seed of a cultivar that can be used as a filler.
 - (b) When there are seed supply issues through timing or quality and varieties need to be substituted.
 - (c) Are preferably from the same seed source and sowing density as other entries in the trial.
 - (i) When (c) above is true, "fillers" should be labelled on the database as the actual cultivar sown.
 - (ii) When (c) above is FALSE, a unique "Filler" ID is used.

5.4 Timing of Operations

(1) The NVT program will be guided by best-practice in each region where trials are conducted and facilitated by engaging with regional NVT Advisory Committees to recommend sowing times and seeding rates. These recommendations will be ratified and implemented by the NVT Management Committee and participating Breeding programs for adoption.

5.5 Calibration and Checking of Weighing Devices (Scales)

- (1) All weighing devices used for the NVT Program must be checked, and calibrated if required, to ensure accuracy and reliability under field/lab conditions. Trial Service Providers must provide details of how their recording devices have been calibrated, when, and by whom, to the NVT Manager when requested.
- (2) All weighing devices used for the NVT Program must be checked on a regular basis during each operation within the NVT program using the appropriate range of certified check weights according to an industry accepted protocol, to ensure accuracy and reliability under field/lab conditions. Trial Service Providers must provide details of how their weighing devices have been checked, when, and by whom, to the NVT Manager when requested
- (3) Should any weigh device fail to meet the check standard during any operation, the weighing device must not be used until it has been recalibrated and certified by a suitably qualified person.

5.6 Germination Windows

(1) Germination Windows are outlined in APPENDIX J.1 – TRIAL GERMINATION WINDOWS.

- (2) Germination windows are the desired date range for the germination of seed for a specific trial series. Seed must be sown to ensure Germination Date occurs within the germination window.
 - (a) The germination date is defined as when the seed is sown and has adequate moisture to germinate. This may be either;
 - (b) When the seed is sown into adequate root zone soil moisture; or
 - (i) When the dry sown seed receives an adequate rainfall or irrigation event.
 - (ii) The germination date is not defined by when the seed 'strikes' or emerges.
- (3) Preferred Germination Windows have been determined via consultation with stakeholders as being representative of "best local practice" to reflect the expected performance of the Goal Post varieties and nominated entries for the specific trial series. Preferred germination windows may be adjusted from time to time
- (4) Unpreferred germination windows, pre or post the preferred germination window, are sub optimal windows in which germination can still occur to allow for delays caused by environmental constraints outside the control of the Service Provider. Management issues or other constraints that could have been avoided by the Service Provider are not considered a valid reason to sow in the unpreferred germination window without the application of KPI Service Credits.
- (5) All trials should be sown to ensure Germination Date occurs within the approved preferred germination windows unless express written permission is given by the NVT manager (this includes sowing in the unpreferred germination window).
- (6) If a sowing opportunity does not occur (due to seasonal conditions) within the germination windows the TSP may request written approval from the NVT manager for trial planting at the earliest opportunity following the germination window. This includes dry sowing prior to the end of the germination window. Approval will be granted provided germination of the trials aligns with commercial crops in the surrounding district.
 - (a) Breeders will be advised of any trials approved for sowing outside the germination window. Breeders opt-out by changing varieties unsuitable for later sowing to fillers.
 - No refund will be provided to breeders for pre-commercial lines which opt-out, as without this mechanism the trial would be abandoned and abandonments have been factored into initial pre-commercial purchasing costings.
 - (ii) Breeders will still be eligible for a Commercialisaiton Credit, for trials where a cultivar has been opted-out.

5.7 Trial Sowing & Dry sowing

- (1) Trials should be sown to emerge within +/- 5 days of the same surrounding crop type (exception Early series wheat trials), unless agreed by NVT Manager.
- (2) The trial configuration must be sown according to the trial design obtained from the NVT database (after the number of entries and trial layout has been confirmed by the Trial Service Provider.)
- (3) Buffers must be included at the start and end of a trial block. Buffers do not need recording in the trial design on the NVT database.
- (4) Packing and sowing plans are used to record alterations due to non-arrival of seed or mishaps in the field at sowing. Packing and sowing plans should be retained by the Trial Managers for a minimum of 18 months after sowing.

- (5) Accurate seed quality information needs to be provided to the TSP on or before the Delivery date as specified in APPENDIX B – NVT NOMINATION AND SEED DELIVERY DATES. In the event no seed quality information is received the TSP will assume a germination percentage of 100% and a seed weight based on the average of all varieties in that trial.
- (6) TSP has the right to remove a variety if seed delivery is late. APPENDIX B NVT NOMINATION AND SEED DELIVERY DATES. The Breeder will be made aware of removed variety.
- (7) The sowing date must be recorded and entered by the Trial Service Provider into the NVT database within 7 days of sowing as outlined in APPENDIX A DATA ENTRY, MILESTONES, KPI.
- (8) Trials require seed to be sown with adequate soil coverage to allow sufficient seed to soil contact thus ensuring even imbibing of moisture and subsequent germination across the trial site.
- (9) Trial Service Providers should ideally use seeding equipment fitted with 2cm GPS guidance system. Sowing equipment design must be so that it can sow into all stubble loads of all previous crops.
- (10) Trials to be sown with rows perpendicular to the grower's direction of sowing and pathways/ranges parallel to grower's direction of sowing.
- (11) Sowing rates vary across the NVT regions, but trial sowing rates and the resultant plant establishment must reflect local best practice as outlined in APPENDIX H CROP SPECIFIC PROTOCOLS.
 - (a) Importantly, all trials should have a consistent and uniform plant establishment across the trial area.
- (12) Seed establishment measured in plants/m², by State, Region & Crop are to be recorded. Suggested plant densities and establishment rates are provided for the guidance of Trial Service Providers. These can be found in APPENDIX H – CROP SPECIFIC PROTOCOLS.
- (13) Dry Sowing
 - (a) Some trials may be sown dry if the co-operator has sown dry or is about to sow dry, but ideally this should be no earlier than 3 days ahead of a promising germinating rain and in consultation with the NVT regional manager.
 - (b) If a promising germinating rain does not occur within the germination windows, the TSP can opt to sow outside the germination windows in line with clause 5.6(6)of The Protocols.
 - (c) The NVT manager is to be notified in writing of all cases where dry sowing is planned.
 - (d) The date of subsequent rainfall, that triggers germination, must be recorded as the 'germination rain date' (sowing date) in the NVT database. The actual sowing date is also to be recorded in the NVT database.
 - (e) Trials that result in patchy establishment have a high chance of being compromised and declared unusable with associated abandonment risk.

5.8 Wetting Agents

(1) Application of wetting agent to potentially non-wetting soils, (Including but not limited to sands with high organic matter content, sands with low clay content, forest gravels etc.) for dry sown trials

(2) Wetting agents should be applied on-furrow as per industry best practice or as a blanket application PSPE at appropriate label rates in label recommended water rates to ensure even germination and establishment of the crop. The use of a wetting agent must have prior approval by the NVT Manager.

5.9 Early Series Trials (Wheat)

- (1) Early Season Wheat Trials
 - (a) These trials must be established within the germination window. If a sowing opportunity does not eventuate within the germination window, the early season trial at a site may be abandoned (subject section 5.6(6)).
 - (b) Where the germination window for Northern region early and main series trials overlaps, and a sowing opportunity eventuates, both trials can be planted simultaneously.
- (2) Early Break Wheat Trials
 - (a) These trials must be established within the germination window. If a sowing opportunity does not eventuate within the germination window, the early season trial at a site may be abandoned (subject section 5.6(6)).
 - (b) Are designed to be reflective of the local environment if germinating rainfall occurs and conditions are suitable for sowing within the germination window. However, if germinating rains do not occur, the following options are available (subject to NVT Manager approval):
 - (i) Shifting of trial location within the region to a site that has received adequate rainfall for germination, or
 - (ii) Supplementary watering during the preferred germination window provided significant rainfall is not forecast during the 2 week preferred germination window

5.10 Supplementary watering of trials and Irrigated Trials

- (1) Definitions:
 - (a) Supplementary Watering -Water applied to trials to initiate germination and establishment or to ensure survival of plants in trials sown in traditional winter rainfed crop zones.
 - (b) Irrigated Trials -These trials occur where irrigation of crops is commonplace and are designed to be irrigated on a regular basis as the primary supply for their water requirements throughout their growing period.
- (2) Supplementary watering of trials may be considered to ensure trials survive where severe post emergent drought is threatening plant survival. NVT Manager approval must be granted before supplementary watering
- (3) When Supplementary water is applied to a trial: the method of application, date of application and mm rainfall equivalent must be recorded and uploaded to the database within 14 days of application.
- (4) Irrigations dates and quantities applied to trials that are planned as irrigated trials are to be recorded and uploaded to the database within 7 days of harvest
- (5) The preferred method of supplementary watering is with pressure compensated drip tape, post sowing. Minimum supplementary watering amounts are 10-25mm on light soils and 20-40mm on heavy soils. Alternative supplementary watering types, where they have been

used successfully in the past, may be used with the approval of the NVT Manager. Supplementary watering must be uniform across all plots in the trial.

5.11 GPS Data Collection

- (1) Entrance Gateway GPS Coordinate Collection
 - (a) The GPS coordinates of the paddock entrace gateway must be recorded for all trials and entered directly into the NVT database by the Trial Service Provider within 7 days of sowing, as outlined in APPENDIX A DATA ENTRY, MILESTONES, KPI.
 - (i) These coordinates should represent the access point off the public roadway where the NVT gate sign is located.
 - (ii) The same set of coordinates should be used for all trials relevant to that entrace point.
 - (b) GPS coordinates must be provided in decimal degrees format.
 - (c) The GPS position must be recorded to an accuracy of six decimal places using an instrument which provides decimal degrees.
- (2) Plot 1-1 GPS Coordinate Collection
 - (a) The GPS coordinates of "Plot 1-1" (Range 1, Row 1) of every trial must be recorded and entered directly into the NVT database by the Trial Service Provider within 7 days of sowing, as outlined in APPENDIX A – DATA ENTRY, MILESTONES, KPI
 - (b) GPS coordinates must be provided in decimal degrees format.
 - (c) The GPS position must be recorded to an accuracy of six decimal places using an instrument which provides decimal degrees.

5.12 KML file collection

- (1) KML (Keyhole Markup Language) is a coding language used to express geographic visulisation, including annotation of maps and images.
- (2) Pathway from Entrance Gateway to Trial Site
 - (a) A kml file that maps the pathway from the entrance gateway to "Plot 1-1" of the trial, or the first trial at a multi-trial site, must be recorded and uploaded to the NVT database by the Trial Service Provider within 7 days of sowing, as outlined in APPENDIX A – DATA ENTRY, MILESTONES, KPI.
 - (b) The same kml file should be used for all co-located trials relevant to that entrance point (if applicable).
 - (c) Trial Service Providers should use an appropriate KML recording device/software to begin "recording" at the access gateway, and continue recording as they drive or walk on the most appropriate route to the "Plot 1-1"
- (3) Trial boundary
 - (a) A KML file that maps the trial boundary GPS coordinates is to be collected on each individual trial and uploaded to the NVT database by the Trial Service Provider within 7 days of sowing, as outlined in APPENDIX A – DATA ENTRY, MILESTONES, KPI.

- (b) Trial Service Providers should use an appropriate KML recording device/software to begin "recording" at the LEFT corner of Plot 1-1 of the trial, and continue recording as they walk the perimeter of the trial in a clockwise direction.
- (c) Do not include the buffers plots.
- (d) Save the files name as "TrialCode.KML" (e.g. WMaA21BREN5.KML), in KML format.
- (4) General Information
 - (a) KML files can be generated using various available smart phone apps or alternative devices. Please contact NVT if you require further information on this.
 - (b) Measurements must be captured in "metric" units.
 - (i) Where applicable (device depending), device settings must be configured to "GPS measuring" to collect "Area" data.

5.13 NVT Signage

- (1) GRDC NVT and Biosecurity (if required), corflute signs are to be placed on a secure, prominent position on the roadside where access from a public road to the NVT trial is gained. NVT signs are to be placed at the paddock access point to the trial site, or at fenceline adjacent to trial where the trial is visible from the road. The aim being to enhance the exposure of the NVT program.
- (2) They should be installed on the day of sowing and remain in place until the trial is harvested.
- (3) Visitors must be able to find the trial of interest at a multi trial location and in these situations an overall site map identifying NVT's should be present at the site.
- (4) TSP should contact the NVT manager if more signs are required. From 2024 TSP's will be responsible for sourcing their own NVT signs based on the details in APPENDIX N FENCE SIGNS.
- (5) Further instructions and details of NVT Signage can be found in APPENDIX N FENCE SIGNS.

5.14 Site Maps/Mud-Maps

- (1) Trial Service Provider must provide a mud-map indicating the location of the trial in relation to the nearest town or main access roads as per the template supplied by GRDC NVT. Contact the NVT Manager for a copy of the template if required.
- (2) The mud-map should indicate the location of the NVT trial in relation to other trials at the same site (if relevant) and indicate the distance including any buffer rows between co-located trials.
- (3) The mud-map should include a text description of access to the trial site, with relevant landmarks and distances from the closest major town and roads. It should also include a marked line that indicates the best access to the trial through the paddock or farm and location of NVT signs.
- (4) Mud-maps must include the GPS coordinates of the site (in decimal degrees format) including coordinates of all Plot 1-1, the gate access off the road and contact numbers for both the Trial Service Provider and the trial co-operator (grower or landowner), and any sitespecific requirements e.g. biosecurity measures, contact farmer etc.

(5) The mud-maps are to be loaded onto the NVT database as required by APPENDIX A – DATA ENTRY, MILESTONES, KPI. This is to allow easy access to trial sites by breeders and site auditors.

5.15 Site Check in and QR Codes

- (1) <u>All visitors</u> to NVT are required to log their visit using the QR Code system in place when accessing trial sites.
- (2) NVT QR codes are to be available in a waterproof container at plot 1-1 at every NVT trial site
- (3) TSP may use the QR codes in other locations (eg site access point, fence signs, newsletters, etc), provided the QR code is also present at Plot 1-1..
- (4) All visitors will be required to use the QR code to access the trial plans for the site.
- (5) In areas of low mobile phone reception a QR code will still need to be displayed on site, however the TSP must either:
 - (a) Leave trial plan on site with the QR code for visitors to access upon arrival, or
 - (b) Provide the trial plan directly to visitors at the time they request authorisation prior to visiting the site.
- (6) The following naming convention should be used by TSP when creating a QR Code Title Descriptions:

Situation	Convention	Example
If a single trial or crop type is present	Location Name and Crop	Beckom Barley
If multiple crops are present from the same crop group	Location Name and Crop Group	Beckom Cereals, Beckom Pulses
If multiple crops are present from different crop groups	Location Name and List Crops/Crop Groups	Beckom Cereals and Canola, Beckom Canola and Lupin, Beckom Pulses and Lupin

5.16 Plot One Identification

(1) An identifying marker (e.g. white peg, plot sign etc.) is to be placed at the front of "Plot 1-1" (range 1, row 1) to allow ease of locating plot 1 and orientation of the field plan for field observations. If multiple trials occur at a site, an identifier for each NVT trial is required

5.17 Trial Management

- (1) Trial Service Providers are required to deliver on time, all aspects of trial management in accordance with the conditions as agreed to in the service provider contracts. Any unforeseen problems must be brought to the attention of the NVT Manager immediately and a course of action initiated as soon as possible thereafter.
- (2) A trial site must not be compromised by weed, disease, insect or pest competition.
- (3) An outbreak of a pest or disease may offer an opportunity for assessment of the resistance/tolerance level of the lines in the trial. The Trial Service Provider should notify the

NVT Manager of such opportunities so that the NVT Manager can organise for the trials to be inspected by a pathologist.

- (4) Trial Service Providers are responsible to ensure that all treatments, including but not limited to, herbicide, pesticides, fungicides, fertilizers and soil treatments, applied to NVT trials must comply with all relevant label registration requirements. For crop specific trial management information please refer to APPENDIX H – CROP SPECIFIC PROTOCOLS
- (5) NVT recognises that off label use of fungicides sometimes occurs to adequately control disease in trials given the wide spectrum of maturities. In instances where off-label use of fungicides does occur, the use must be reported to the Regional Manager, details accurately captured in the database (as per any other chemical use), and an appropriate management plan put in place to ensure correct disposal of harvested grain.
- (6) Fertiliser management should aim to achieve the highest expected yield for the site given the seasonal forecast. Fertiliser management should include fertiliser application at sowing and top dressing with appropriate application rates and timings based on seasonal forecasts. Trace element fertilisers should also be applied. For crop specific trial management information please refer to APPENDIX H – CROP SPECIFIC PROTOCOLS.
- (7) Trial Service Providers are responsible to ensure all treatments to NVT trials must be applied by a fully qualified staff member or contractor.
- (8) The use of plant growth regulators (PGRs) on NVT trials is prohibited unless approved by the NVT Manager. PGR treatments must be applied at a the same growth stage for all varieties in the trial. This may require hand-spraying selected plots of similar maturity groups. Trial Service Providers must provide the NVT Manager with a copy of their Standard Operating Procedure for applying PGRs before approval will be granted. Use of PGRs may be necessary in high-rainfall and/or long-season environments such as Tasmania.

5.18 Trial Monitoring

- (1) The site must be regularly monitored by the Trial Service Provider for weeds, pests, diseases or other incidents, such as grazing or storm damage.
- (2) The site must be inspected by the Trial Service Provider (at a minimum).
 - (a) 4 weeks after sowing, (Establishment/Emergence check).
 - (b) 2 weeks after each herbicide application,
 - (c) At flowering, and
 - (d) Prior to harvest.
- (3) A record is to be made of each inspection, including the name of the individual who conducted the inspection.
- (4) Each trial must have a Trial Rating uploaded to the NVT database as per APPENDIX A DATA ENTRY, MILESTONES, KPI.
 - (a) The Trial Rating should indicate the potential outcome of the trial, incorporating the seasonal and management quality of the trial.
 - (b) The Trial Rating should be conducted using a 5-1 scale, where;
 - 5 = Excellent trial, no issues.
 - 4 = Good trial, should produce ok results.

3 = Average trial, site has issues and needs work for the results to be meaningful.

2 = Poor trial, site has issues and is unlikely to produce meaningful results.

1 = Trial has been abandoned.

- (c) The Trial Rating may change for individual trials as the season progresses. Multiple ratings may be entered for each trial TSP milestone, ratings should be updated after each visit.
- (d) The Trial Rating will be used to communicate the potential outcome of the trial throughout the growing season and assess if any actions are required to improve the outcome of a trial.
- (5) The cooperating farmer may be prepared to assist in monitoring, by reporting any incidents or problems to the Trial Service Provider. However, this does not replace the responsibility of the Trial Service Provider to monitor the site.
- (6) Measurements specific to each crop are covered in the NVT Crop Specific Protocols.
- (7) Establishment counts /scores are required as per APPENDIX E STANDARD OPERATING PROCEDURES
- (8) Yield limiting factors such as frost, disease, weeds, nutrient deficiency/toxicity, and drought are to be recorded and reported. Where required, plot scale observations are to be taken on the trial and entered directly into the NVT database as per APPENDIX E – STANDARD OPERATING PROCEDURES.
- (9) GRDC protocols and SOPs for individual agronomic or disease characteristics are to be followed when taking plot observations.
- (10) All trials should have Zadoks or NVT approved growth ratings.Refer to table F.4 Trial Measurements Table "growth stage in APPENDIX F – STANDARD OPERATING PROCEDURES for specific details.
- (11) Any incident, accident or other factor that could impact the accuracy or reliability of the trial, especially anything that differentially affects breeding lines or standard varieties, must be reported to the NVT Manager immediately. These include frost, and heat shock.
- (12) The Trial Service Provider must notify the NVT Manager of any trials, and/or plots, that have been compromised that could lead to possible abandonment, or partial abandonment, within 24 hours of detection.
 - (a) For plot specific issues, the affected plots are to be designated as "missing", and plot yield set to "N/A" within the database. An identificable reason as to why the plot has been set to "N/A" must be attached to the trial in the NVT database. Plots with general patchiness are not to be N/A.
- (13) If plot lengths are required to be adjusted, all plot lengths in that range must be adjusted to remain the same.

5.19 Trial Measurements and Plot Observations

- (1) Plot observations recorded by the Trial Service Provider can be either variates or covariates.
 - (a) **Variates** relate to a cultivar (height, flowering time, etc.) and allow information on the agronomy of a cultivar to be collected to allow a validity check that a cultivar is in the correct location. Variates are generally cultivar specific traits.

- (b) Covariates are location based, independent of cultivar, and influence the accuracy in cultivar performance. Covariates include uneven establishment within a trial, weed infestation, blocked or missing rows, etc. Covariates are very important and, when taken, are required for every plot, not just one replicate. Covariates are important in analysis and hence must be accurately measured and well described within the database.
- (2) A list of NVT acceptable covariate and variates have been included within APPENDIX E STANDARD OPERATING PROCEDURES. All covariate data should be entered on the NVT database within 7 days after sampling/recording as outlined in APPENDIX A – DATA ENTRY, MILESTONES, KPI and must accompany harvest yield data when a trial is flagged as "Ready for Biometrician Analysis".
- (3) All plot measurements collected, are tested by the biometrician for non-genetic dependence (true covariate) and significance of measurement.

5.20 Plot Pathways

- (1) Pathways between ranges should be managed to provide easy access to visitors during the season. This may necessitate desiccant spraying or slashing prior to anthesis. Bearing in mind this management must not cause erosion risk on light soils.
- (2) The preferred timing of pathway management is before stem elongation, unless approved by the NVT Manager.
- (3) Pathways must be straight (perpendicular to plot row direction) to ensure uniform plot length and if pathways are not straight, individual plot lengths must be measured and recorded.
- (4) Pathways must be trimmed to ensure any staggering of rows and plot ends are removed.

5.21 Weather Data Recording and Use

- Temperatures experienced by the growing crop are to be recorded using Tinytag temperature sensors, installed and managed as per APPENDIX F – STANDARD OPERATING PROCEDURES, Tinytag Data Loggers Directions.
- (2) Trial Service Providers are responsible for the supply, maintenance, and accuracy of all data recording devices including the annual replacement of Tinytag batteries and associated costs.
- (3) Trial Service Providers are required to collect minimum and maximum temperature data for each site (not each trial at each site). However, trials in different paddocks within the same locality require data collection in each paddock.
 - (a) At sites with multiple trails, the temperature data is to be collected when the first trial is harvested.
- (4) Tinytag should be installed on the day of sowing the first trial at each location where a Tinytag is required. The Tinytag should be removed immediately prior to harvest.
- (5) Trial Service Providers are required to ensure calibration, positioning and downloading of these loggers as per SOP directions.
- (6) Minimum and Maximum temperature at 15-minute intervals are taken as per explanation in the SOP.
- (7) Tinytag and/or weather station data is to be loaded onto the NVT database with 7 days of harvest as per APPENDIX A DATA ENTRY, MILESTONES, KPI

5.22 Rainfall

- (1) Monthly rainfall measurements must be captured for all NVT trials, including those that are abandoned throughout the season.
- (2) Monthly Rainfall totals must be captured for a full 12 month period as per the following:
 - (a) Winter crops: Monthly rainfall totals must be entered into the NVT database for all 12 months of the calendar year (Jan-Dec) for each trial
- (3) Rainfall Data Source
 - (a) Rainfall totals should be captured from localised rain gauge at the trial site, or from a gauge monitored by the grower/co-operator ("Farmer Records").
 - (b) If a. above is not possible, rainfall data from the nearest BOM station can be used.
 - (c) Paddock Gauge records may be supplemented with BOM data for those months where it's not possible to capture rain gauge data in the field (i.e. outside the growing season). The appropriate "Rainfall Data Source" field must be selected on the NVT database.
- (4) If the monthly rainfall total is zero, then zero (0) must be specified in the database, rather than being left blank.
- (5) Rainfall data is to be entered on the NVT database by Jan 31 (winter crops) as per APPENDIX A DATA ENTRY, MILESTONES, KPI.

5.23 Field Days (Public)

- (1) It is highly desirable for public field days to be held on most sites, to promote the NVT system and to enable local growers and advisers to see the advanced breeding lines firsthand.
- (2) The Trial Service Provider is responsible for ensuring that the NVT trial at a field day site is presentable and safe. The Trial Service Provider is not responsible for hosting field days unless prior arrangements have been made with the NVT Manager.
- (3) If one breeding program/company wishes to speak at the field day, the same opportunity must be given to representatives of all breeding programs/companies whose breeding lines are sown at the site.
- (4) The Trial Service Provider MUST NOT accept sponsorship, or money, or any product from a sponsor or Breeder participant.
- (5) At a field day, one replicate (usually the first range) is to be signposted with the names of released varieties, local check varieties and the breeder's code number.
- (6) If a breeding line has been commercially released prior to the field day, its name is to be signposted.
- (7) Signage is to be of the same type and size for all genotypes, with all companies equally displayed.
- (8) The use of larger or more colourful company specific genotype signage is prohibited for both Trial Service Providers and Breeder representatives.
- (9) The Trial Service Provider may be asked to present at a field day summarising the agronomic management to the visiting group. This is at the Trial Service Providers discretion.
- (a) It is not the responsibility of the Trial Service Provider to create or execute field days for NVT sites unless otherwise stipulated in a separate contract based around extension and communication.
- (10) No destructive handling of any plants in any plots may occur at a field day. The field day manager must maintain the field day guests to pathways and ensure no plot access occurs to avoid site trampling.
- (11) If a Breeder wishes to access a site, this is not viewed as a field day. Breeders have full access to all sites at any point deemed to be safe for the visitor. Breeders must contact the Trial Service Provider to allow the grower to be notified, and the Trial Service Provider to inform the breeder any reason it is unsafe to do so at that point. (e.g. just been sprayed by a pesticide, and a breach of withholding periods)
- (12) Abandoned trials/trial sites must not be shown or made available for field days. Plots must be obscured of the abandoned trial prior to the holding of a field day where the trial is colocated with other remaining viable trials see 8.5 Management of Abandoned trials/trial sites.

5.24 Breeder Use of Trial Sites

- (1) NVT Participating Breeders may want to utilize NVT sites for extension, promotion, or training purposes. Use of NVT sites is contingent on the following:
 - (a) Authorization for access and use has been received by the Trial Manager and Trial Co-operator; and all instructions provided are obeyed. Including
 - (i) Entry & exit from the site
 - (ii) Farm biosecurity requirements
 - (b) There is no impact or damage caused to trial plots
 - (c) All traffic is kept to approved walkways
 - (d) No information is shared on unreleased lines in the trials, (traits, data, NVT results). This includes NVT results of the breeder's unreleased lines.
 - (e) Social media use while on site is allowed however any issues identified should be raised directly with the Trial Manager and NVT team (not via public forums).
 - (f) All trial and agronomic issues identified should be raised directly with the Trial Manager and NVT team
 - (g) Breeder branded signage is permitted, however it can not obstruct any NVT or TSP signage already in place. All signage must be removed following completion of the event.
 - (h) NVT, GRDC, and TSP should be acknowledged in all communications and documents relating to any events.
 - (i) Use of drones to capture images is permitted provided CASA regulations are followed and permission is granted by the Trial Manager and Trial Co-Operator.
 - (j) Any data or measurements collected from the trial site must be done so according to the *NVT Data and Resource Sharing Key Requirements*.

6 UNMANNED AERIAL VEHICLES (UAV/DRONES)

- (1) UAVs are not to be flown over NVT sites without express permission of the Co-operator, Service Provider and NVT Management.
- (2) NVT Participants (Participating Breeders, Service Providers, NVT management and authorised third party researchers) are permitted to fly UAVs over NVT Sites for the purpose of recording images and/or video of the trials, providing the pilot is suitably qualified or certified.
- (3) NVT must have access to all images and video recorded over NVT sites when requested.
- (4) No images or data collected via the use of UAV's are to be used publicly without the express written permission of GRDC and NVT.

7 HARVEST AND GRAIN QUALITY

7.1 Harvesting

- (1) The harvesting equipment should be well maintained, and staff involved well trained to minimise grain or oilseed loss, and to minimise grain damage such as cracking and splitting. At least one staff member on site at harvest should be experienced with harvesting each crop type at the site and proficient at setting the harvester for optimum efficacy of grain harvest, ensuring all heads/pods are captured by the harvester, heads/pods are completely threshed without excessive grain damage, and the minimum amount of grain lost out the back of the harvester.
- (2) Harvester settings must be adjusted to suit each crop type prior harvesting trial plots by harvesting buffer plots, including but not limited to cutter bar height, reel height and speed, drum speed and concave settings, sieves and wind. During harvester set up (and throughout harvesting each trial) harvester efficiency should be checked to ensure all grain is collected by the harvester. Adjustments to harvester should be made to ensure all plants and parts thereof are collected by the harvester and fully threshed before exiting the harvester. Do not assume that standard harvester settings will be sufficient for each different crop type and different maturities of crop type through the season.
- (3) Each trial must be harvested at the earliest opportunity after physiological maturity, including the late goalpost varieties (where included) and expiration of any withholding period of herbicide applied as crop topping or desiccation, to minimise grain losses through wind, insect, rain, or pest damage. Do not delay harvesting trials that are ready to harvest to coincide with harvesting later trials at the site. Trial Service Provider must advise the NVT Regional Manager before harvesting in sub-optimal conditions in order to avoid grain losses (e.g. wind, insect, rain, or pest damage).
- (4) Timing of harvest and crop topping/desiccation will be determined by the desiccation standard and 'goal post' varieties specified in the crop specific protocols. Harvest should not be compromised by waiting for the last cultivar/s to ripen if that cultivar/s are later maturing than the late goal post varieties. Any late maturing varieties/lines that were crop topped/desiccated early should be recorded and NVT Manager notified. In the absence of desiccation standards and/or goal post varieties the desiccants should be applied after the majority of varieties/lines have reached physiological maturity where yield and quality will not be compromised.
- (5) Application of desiccants as a Harvest Aid to control late regrowth, weeds etc, is permitted where NVT Manger grants permission in writing. All lines in the trial must be mature and individual line yields must not be adversely influenced by the application of the harvest aid desiccant. Only registered products to be applied to each specific crop. All appropriate withholding periods must be adhered to.
- (6) All plant rows within a plot must be harvested including all outside and middle rows.

- (7) All trials are to be harvested in one direction (not a serpentine pattern) and that direction is at the discretion of the TSP. The direction of harvest must be selected that optimizes the capture of grain for the majority of lines within each trial.
- (8) Harvester set up and operation must endeavour to capture all the grain from each plot including short varieties, lodged varieties, early maturing varieties and hard to thresh lines. Sometimes this will be at the expense of grain sample cleanliness. It is an expectation that grain from plots will be cleaned to an adequate standard prior to grain quality testing which may necessitate re-threshing and cleaning of samples.
- (9) The harvester set up, operations and timings must allow for adequate cleaning of the harvester between plots to ensure no carry-over of grain between plots.
- (10) Observations of any damage to plots prior to harvest are to be recorded by the Trial Service Provider and reported to the NVT Manager. Observations prior to harvest include but not limited to head loss, shattering, weak straw or lodging as described in the crop specific protocols.
- (11) Any losses of grain that may have occurred at, prior to, or during harvest must be recorded and reported. Plots should be inspected immediately post-harvest to ensure no excessive grain loss has occurred during harvest. Where differences in seed losses are observed between plots the whole trial should be scored for that factor e.g. grain/pod loss and captured as a pre-harvest assessment to be considered for use in the statistical analysis, refer to APPENDIX F – STANDARD OPERATING PROCEDURES.
- (12) The decision of what harvest method to use is determined by the Trial Service Provider, but the outcome must be that grain loss is minimised, and that there is NO variation in grain loss between Cultivars.
- (13) The Trial Service Provider is to ensure all harvesting equipment is cleaned after completion of harvesting trials and before leaving the site.
- (14) The Trial Service Provider must retain a minimum of 500-gram sample of each cereal plot and minimum 300-gram sample from each canola and pulse plot harvested grain for auditing purposes (e.g. confirmation of genetic identify) until the following sowing time, or as deemed necessary by the NVT Manager. Grain samples must be kept in a permanently labelled sample bag and stored in a cool dry place.
- (15) Additional grain must be retained at harvest to ensure that the **minimum** weight of composite cleaned grain sample for quality assessment and audit is also retained. See table below for minimum sample quantities.

		REP1	REP2	REP3	
CEREALS	CEREALS composite		1kg		retain for up to one year
	plot	0.5	0.5	0.5	retain until seeding
CANOLA &	composite		0.5 kg		retain for up to one year
PULSES	plot	0.3 kg	0.3 kg	0.3 kg	retain until seeding

- (16) Any remaining grain after sample collection from Breeder lines must be handled in accordance with the signed MTA. If no specific instructions are provided in the MTA grain from breeders lines should be handled the same as grain from commercial lines and must be handled in accordance to the NVT Managers instructions, which will include the mixing of grain into a bulk that obscures the genetic identity of a breeder's line. The Trial Service Provider must keep a record of the method and date of their destruction. Bulked grain must not be replanted or distributed to breeding programs or seed suppliers.
- (17) Harvested grain from each plot must be separately and accurately weighed, preferably on site, but if off site then a robust system of bagging and labelling must be instituted. Any grain from plots that may be contaminated with dirt, rocks straw etc. must be cleaned before weighing and recording the harvested grain weight

(18) Data pertaining to harvesting must be uploaded to the NVT database by the NVT Service Provider within 7 days of harvest date as outline in APPENDIX A – DATA ENTRY, MILESTONES, KPI.

7.2 Grain Quality

- (1) Varieties included in the NVT yield program will be eligible for grain quality testing with the following conditions.
 - (a) Varieties are accepted for grain quality assessment on a crop by measurement type basis as tabled in APPENDIX F GRAIN QUALITY ASSESSMENTS AND SOPS.
 - (b) Commercial varieties included in the NVT trials will be eligible for all relevant crop by measurement assessments.
 - (c) Pre-commercial varieties included in the NVT trials will be eligible for all relevant crop by measurement assessments.
 - (d) GRDC may exclude any cultivar from the grain quality assessment.
- (2) Grain Quality assessments are conducted only on trials that are deemed suitable for MET inclusion and are included in the Long Term Yield Reporter (LTYR) dataset. Grain Quality assessments are <u>NOT</u> required for trials that are deemed unsuitable for inclusion in the Long Term Yield Reporter (LTYR) dataset as identified on the NVT database as MET Include "NO".
- (3) Grain Quality determination samples are to be cleaned (aspirated) without removal of whole grain i.e. free of chaff, awns, cracked grain and other impurities. Barley is to be de-awned prior to testing.
 - (a) Remaining impurities must be measured and recorded in the NVT database (e.g. % of cracked grain in the screenings sample).
- (4) Testing is to be conducted according to APPENDIX F GRAIN QUALITY ASSESSMENTS AND SOPS.
- (5) Testing is to be conducted using the approved equipment referred to in APPENDIX F GRAIN QUALITY ASSESSMENTS AND SOPS (any alternatives from the approved equipment listed requires approval by the NVT Manager).
- (6) All the test results are to be entered onto the NVT database by the Trial Service Provider within 60 days of harvest date, or by Jan 31 (whichever is sooner).
- (7) Facilities undertaking NVT Grain Quality determination must have evidence that annual calibration of ALL grain quality measuring equipment has been conducted by an approved third party. Evidence may be in the form of certification from calibration service technician/company and should be provided to the NVT Manager on request.
- (8) The Trial Service Provider must retain a minimum of 1000 g cleaned grain sample for cereals, 500 g cleaned grain for Canola and pulses, for the determination of grain quality and/or for auditing purposes for one year, or as deemed necessary by the NVT Manager. The retained sample should be the same sample as used for the quality assessments.
- (9) The NVT team reserves the right to access facilities undertaking NVT Grain Quality determinations for auditing purposes.
- (10) It is a requirement of all Facilities undertaking NVT Delivery Standard Determination to provide a member of staff to participate in Grain Assessment Training when determined and provided by GRDC.

(11) Grain quality measurements are to be conducted to the approved standards as outlined in APPENDIX F – GRAIN QUALITY ASSESSMENTS AND SOPS.

7.3 Grain Quality Assessment Audits

- (1) Trial Service Provider will identify the Grain Quality Lab/s being used at the commencement of each contract period. The TSP shall immediately notify NVT Management of any changes to the nominated lab/s used during a contract period
- (2) The Regional NVT Manager will identify the samples the Trial Service Provider will be requested to forward for auditing each year. Primary crops of interest are Wheat, Barley, and Canola; but samples of other grains may be requested.
- (3) At the request of the Regional Manager, the Trial Service Provider will forward the specified retained samples per 7.2(9) 39 to the designated independent accredited Grain Quality Laboratory, via the freight company nominated by NVT Management, these may change from time to time.
- (4) Request for samples will commence by January 31st with the delivery to the independent Laboratory within 2 weeks of the request
- (5) The cost of testing and freight of the audit samples to the accredited laboratory will be covered by the Trial Service provider.

7.4 Site Clean Up

- (1) If the site requires clean-up, including removal of fencing, it must be done as soon after harvest as practicable to ensure good relations with the co-operator and local community. Details of any arrangements regarding site clean-up should form part of the Co-operator Agreement.
- (2) Sites that have been abandoned should be maintained or cleaned up in accordance with any arrangement with the grower co-operator.

7.5 Grain Sample Requests and Access (Breeders and Third Party Researchers)

- (1) The NVT Manager may request the TSP provide grain harvested from NVT plots to NVT Participating Breeders or Third Party Researchers.
 - (a) TSP can only supply grain after receiving written authorisation to do so by the NVT Manager
 - (b) The TSP has the right to negotiate and recover all reasonable costs for supply of this grain from the receiver.
- (2) All applications for post-harvest grain samples must be submitted to GRDC prior to July 31st each year.
- (3) Further information on accessing NVT grain samples can be found in the <u>NVT Data and</u> <u>Resource Sharing Key Requirements</u> document.

8 ADMINISTRATION

8.1 NVT Database

- (1) All information from any aspect of the NVT program should be stored on the secure NVT controlled database.
- (2) Relevant dates for the entry of data and associated milestones are outlined in APPENDIX A – DATA ENTRY, MILESTONES, KPI, and may be subject to change following consultation between the NVT Manager and Trial Service Providers.
- (3) Access to the NVT database is provided to Trial Service Providers for the purpose of managing NVT trials.
- (4) Training in the use of the database will be coordinated by the NVT Manager.
- (5) User guides for growers and advisors, breeders and trial managers are available on the web site at <u>www.nvt.grdc.com.au</u>

8.2 Data Entry to NVT Database

- (1) All service providers are required to enter all data as required as per APPENDIX A DATA ENTRY, MILESTONES, KPI, and APPENDIX E STANDARD OPERATING PROCEDURES.
- (2) All Trial Service Providers are to report any potential delay in data entry to the NVT Manager in writing prior to the specified data delivery time.
- (3) NVT database user issues, bugs, errors and help requests can be emailed to nvt.help@grdc.com.au.

8.3 Auditing

- (1) An audit of all trials will be conducted periodically during the growing season to monitor achievement against required outcomes and overall progress of the trial.
- (2) The aim of such audits will serve to reinforce stakeholder confidence in the NVT system.
- (3) An example of the trial audit template is found in APPENDIX D NVT TRIAL AUDITING

8.4 Abandoned Trials

- (1) If a Trial Service Provider finds that a trial has been compromised, and/or may generate poor results for any reason, the NVT regional manager must be notified within 24 hours. The NVT regional manager will decide a plan of action for the trial, which may include abandonment.
- (2) The NVT manager retains the option to obtain other expert opinion around options for a trial, before the final decision on a trial's abandonment will be made.
- (3) The NVT manager retains the authority to abandon any NVT trial. The NVT trial manager will provide direction in writing to the Trial Service Provider in this case.

8.5 Management of Abandoned trials/trial sites

(1) Where trials have been abandoned post sowing, Trial Plans, Plot markers and any other identifier must be immediately removed from the site including removing from site plan and map stored on site if the abandoned trial is co-located with other remaining viable trials.

- (2) Abandoned trials need to be destroyed as soon as practical after the abandonment decision has been made.
- (3) Trials may be destroyed by spraying out with appropriate herbicides, mechanically slashed or over sown with same crop type to ensure that no genetic material can be individually identified/obtained, and plots are obscured whichever method is preferred by the co-operator.
- (4) Trials abandoned post flowering have the option to be bulk harvested with all harvested lines mixed to obscure genetic identity of lines. Individual plot grain weights must not be recorded.
- (5) Abandoned trial sites need to be managed to ensure that weeds are controlled throughout the season to ensure that the site is returned to the co-operator in a satisfactory and clean condition.
- (6) Where all trials located at the site have been abandoned the NVT Roadside Sign must be removed as soon as practical after the abandonment decision has been made.

8.6 Trial Outcomes

- (1) Individual trials will be assessed by the NVT manager to fit into three possible outcomes:
 - (a) Released trials that meet the NVT quality standards are harvested, and results are published. Trials that meet these standards are uniform and are not affected by severe yield limiting factors.
 - (b) Unreleased trials that do not meet the NVT quality standards are published in the NVT quarantine trial report. These trials may be affected by the following:
 - (i) Site mean yield is below 0.3 t/ha.
 - (ii) Trials that have a P value > 0.2
 - (iii) Trials with an F value <1
 - (iv) Trials affected by seasonal agronomic issues that unduly change cultivar rankings. Issues may include frost, shattering, animal damage, herbicide damage or not managed in accordance with the NVT Protocols.
 - (c) Abandoned trial that are not harvested. These trials have been compromised by high trial variability and covariates scores cannot be applied to an effective level. These trials are not considered to be a representative comparison between lines/varieties in the trial and the data has no value for genetic comparison.
- (2) Trials are assessed for inclusion or exclusion in the MET analysis
 - (a) MET excluded trials are excluded from the MET analysis where:
 - (i) Trials affected by seasonal agronomic issues that unduly change cultivar rankings. Issues may include frost, shattering, animal damage, herbicide damage or not managed in accordance with the NVT Protocols.
 - (ii) Abandoned trials.
 - (iii) Trials are genetically bound (as determined in the MET analysis by SAGI).
 - (b) MET included all other trials are included in the MET analysis.
 - (c) Not all trials assessed as unreleased at the single site reporting level are excluded from the MET analysis. MET analysis can overcome some of the issues with single site reporting
- (3) Trial Outcome decisions will be made by the NVT manager, and outcomes will be communicated to participating breeding programs and relevant Trial Service Providers at the earliest, appropriate opportunity.

- (4) Assessing trials for realease after high disease pressure season
 - (a) Trial results will be released and included in the MET analysis if;
 - (i) Two or more fungicide applications have been applied at an appropriate timing to manage the goal post varieties.
 - (ii) Less than two fungicides have been applied where appropriate e.g. low rainfall, no disease pressure environments if seasonal district practice did not require fungicide.
 - (b) Trial results will be quarantined and excluded from the MET analysis if;
 - (i) The above conditions are met, but;
 - (ii) Varieties rated MRMS or above have significant yield loss (greater than 50%) determined by in-trial observations and post-harvest analysis.
- (5) Trial stakeholders are invited to provide feedback regarding single site trial outcomes, MET datasets and analysis methodology before analysis and publication. Final decisions and outcomes are at the discretion of the NVT Manager. The review periods include:
 - (a) Single site analysis review period five (5) working days beginning from the date of analysis before single site results are published.
 - (b) MET preliminary review period two (2) working days before the Multi Environment Trial (MET) analysis begins.
 - (c) MET review period five (5) working days from the date MET analysis results and report are circulated before the MET results are Published.

8.7 Trial Service Providers End of Season Report

- (1) An 'end of season' summary report from the Trial Service Provider outlining delivery against requirements and including any otherwise unrecorded issues is required.
- (2) The Trial Service Providers End of Season report must be provided to the NVT Manager in MS Excel or MS Word format prior to the final season payment.
- (3) The document should report on all compromised trials, the column heading should be:

Location Trial Id. Sow Harvest General Comments Date date
--

- (4) General Comments should include a summary of all environmental & management issues occurring including
 - (i) Environmental factors affecting trial Outline any environmental factors that impacted successful delivery or impacted trial quality (cause, extent of impact)
 - (ii) **Response to environmental factors -** Actions taken to salvage trials, actions taken to avoid similar issues occurring in future,
 - (iii) Management factors affecting trial Outline any management factors that impacted successful delivery or impacted trial quality (cause, extent of impact)
 - (iv) **Response to management factors -** Actions taken to salvage trials, actions taken to mitigate future occurrence,

8.8 **Reporting to NVT Manager**

(1) Trial Service Providers are required to notify GRDC NVT managers of any issue effecting potential trial rigour or trial viability within 24 hours, and as per APPENDIX A – DATA ENTRY, MILESTONES, KPI.

(2) Trial Service Providers are to immediately report to NVT manager by phone and email of any issue that arises that could potentially impact or implicate on GRDC's reputation.

8.9 Milestone Reporting

- (1) All milestones are to be completed by their due date as specified in APPENDIX A DATA ENTRY, MILESTONES, KPI
- (2) If any milestone requirement cannot be complied with then the NVT manager is to be notified in writing prior to the specified milestone completion timeframe.
- (3) The correspondence must clearly identify noncompliance and the reason for the noncompliance.

8.10 Quality Assurance

- (1) All Trial Service Providers must have appropriate Standard Operating Procedures and/or Quality Assurance procedures, to ensure the outcomes established in this document.
- (2) All staff must be adequately trained to accurately achieve these outcomes before they are permitted to undertake any activity on NVT trials.

8.11 Trial Service Providers Key Performance Indicators

(1) The assessment criteria, with minimum service standards are described in APPENDIX A – DATA ENTRY, MILESTONES, KPI.

8.12 Data Terms of Use

(1) All data is the ownership of GRDC and <u>only data that is published by GRDC</u> can be used, replicated, published, supplied or communicated to anyone other than GRDC unless requested by GRDC with an express written request.

8.13 Data & Resource Use Agreement for External Researchers

- (1) It is recognized that here may be opportunities to deliver greater returns from the GRDC NVT sites, data and other resources, whilst still delivering against the core GRDC NVT objectives. E.g., NVT trials could be used for the development and validations of nondestructive measurements of phenotypic reactions.
- (2) The use of any NVT trials or data will require written approval from GRDC. Researchers should contact the GRDC manager with requests in line with the <u>NVT Resource Sharing Key</u> <u>Requirements</u>. Approvals will be granted on a case-by-case basis.

A.2 TSP Data Entry Requirements

Activity	Date for completion (uploaded to NVT database or provided to NVT)
Chain of Custody documents	April 30
Material Transfer Agreement	April 30
documents	
Predicta B results	April 30 – Predicta B barcodes uploaded to NVT database
	(results provided directly to GRDC by the testing laboratory)
Sowing date	48 Hours after sowing
Effective germination rain date	7 days after rain event
GPS coordinates	7 days after sowing
Trial maps (mud-maps)	Canola – May 31
	Other Crops – June 15
Trial Rating (1-5 scale)	July 1; (post-sowing)
	August 15
	October 1
	Nov 15 - Jan 15; (at harvest)
Paddock history	July 31
Seeding rate	July 31
Soil test results	July 31
Soil characterization	July 31
Missing plots, and sowing/layout	July 31
changes	
Trial management applications	July 31
(fertiliser, herbicide, fungicide,	
insecticide, irrigation)	
Co-operator agreement declaration	July 31
Trial and plot measurements	10 days after measurement taken; or within 7 days of harvest; or
	at the time the trial is flagged as "Ready for Biometrician
	Analysis". (whichever is earliest)
Temperature and/or weather station	7 days after harvest (or at the time the trial is sent to
data	biometricians for analysis)
Rainfall Data Jan- Oct	December 31
Rainfall data Oct - Dec	January 31
Irrigation and supplementary watering	January 31 or 1 month after harvest whichever is earliest
Trial management applications	January 31 or 1 month after harvest whichever is earliest
(fertiliser, herbicide, fungicide,	
insecticide)	
Harvest date	48 hours after harvest
Harvest data	7 days after harvest
Grain quality data	60 days after harvest, or by Jan 31 (whichever is earliest)
Notification of compromised rigour of	24 hours
trial or need to abandon site	
Notification of potential compromised	24 hours
GRDC reputation	
End of season report	60 days after harvest or by 31 March (whichever is earliest)

A.4 Milestones

Milestone	Descrip	otion	Recurring
1	(a)	Trials designed, and sites prepared for sowing for early sown wheat by 7 th April	30 April
	(b)	Trials designed, and sites prepared for sowing for main season crops (relevant by region) by April 21.	25% Payment
	(c)	NVT MTAs executed in accordance with the agreement.	
	(d)	NVT seed allocation received, and all seed transfer documentation finalised with copies sent to the NVT manager.	
2	(a)	All trials planted as per district grower practice and within the NVT germination window for each crop within each region; or as directed by the NVT Manager. *	31 July (*specific
	(b)	Sowing date and GPS coordinates to be entered on the NVT database within 7 days of trial sowing date.	windows provided in the
	(c)	Variations to trial randomisations reported to the NVT Manager and modified in the NVT database ASAP after sowing each year and no later than 31 July each year.	NVT Protocols)
	(d)	Site details, soil moisture, soil characterisation (test results), target seeding rate and sowing depth and paddock history details entered on the NVT database for each trial site in accordance with the NVT Protocols.	25% Payment
	(e)	Predicta B sampling completed for each trial site in accordance with the Predicta B sampling protocols, and samples mailed to the Predicta B laboratory at SARDI.	
	(f)	Fertiliser usage, and chemical applications to date, entered onto the NVT database.	
	(g)	Confirmation of all co-operator acceptance of trials.	
3	(e)	Contract representative to attend the NVT Management Committee meeting (held between July and September each year).	30 November 10% Payment
	(f)	Provision of opportunistic observations in relation to agronomic traits, i.e. plant height, Growth Stage, etc, to the NVT database.	
	(g)	Provision of fungicide application data, and other fertiliser and chemical treatments to date to the NVT database.	
	(h)	Covariate and variate measurements taken and reported into NVT database as per the NVT protocols.	

4	(i)	All trials harvested in their optimal window.	31 December
	(j)	All yield data entered onto the NVT database for each trial within 7 days of harvest date	(*specific harvest
	(1.)	All as writes measurements antered ante the NV/T	timing provided in
	(K)	database 10 days after measurement taken; or within 7	the
		days of harvest; or at the time the trial is flagged as 'Ready for Biometrician Analysis'. (whichever is earliest)	NVT Protocols)
	(I)	Weather logging data loaded onto the NVT database within 7 days of harvest date (targeting the same date harvest data is entered).	25% Payment
	(m)	Laboratory equipment used for conducting grain quality analysis is calibrated to industry standards outlined in the NVT protocols. Evidence of calibration is provided to GRDC.	
5	(n)	Grain quality measurements taken in accordance with the	28 th February
5	(''')	NVT protocols and submitted to the NVT database.	20 10010019
	(\mathbf{o})	End of soason roport submitted to NV/T Manager outlining	15% Payment
	(0)	delivery against the required service levels.	

A.6 Key Performance Indicators

No.	Assessment Criteria	Expected standard
1.	Trials are sown at Sites as allocated	Trials are sown within 25 kms of the allocated Site name (unless
	by the NVT Manager	otherwise approved by the NVT Manager).
2.	Trials are sown at correct time as	Trials sown in the appropriate germination window (as per NVT
	directed by the NVT Manager	Protocols).
3.	Plot one identification	Plot one, Range 1 clearly identifies the crop and Trial series.
4.	QR codes	QR codes located at Trial Sites.
5.	Use of Trial Co-operator Agreement	Trial Manager has provided a declaration that trial co-operator agreements are in place, in line with the requirements of the NVT Protocols. Upon request of the NVT Manager, the Trial Service Provider is able to provide a copy of individual Trial Co-operator
6	The GRDC investment in NVT is	Trials are readily visible from the closest road (including formed
0.	acknowledged and noticeable at all NVT Sites	and stable in-farm access routes) unless negotiated otherwise with the NVT Manager prior to sowing. Visible GRDC/NVT signage is displayed.
7.	Site selection and uniformity	Adequate Site selection in line with NVT Protocols.
8.	Trial layout within paddock	Trial appropriately positioned within paddock to align with Site constraints, including alignment of plot pathways with grower wheel tracks, and in line with the requirements of the NVT Protocols.
9.	Trials are established as per target plants/m2	Trials have a uniform plant establishment in accordance with the nominated plant density numbers.
10.	Trials with uniform plot spacings	Trials with all plots having a uniform plot spacing.
11.	Trials with uniform number of rows per plot NOTE: Dry sown trials affected by lack of rain are discounted.	All plots in a Trial with the same number of rows.
12.	Disease management of Trials	Managed in line with minimum requirements as per NVT Protocols.
13.	Nutrition management of Trials	Managed in line with minimum requirements as per NVT Protocols.
14.	Pest management of Trials	Managed in line with minimum requirements as per NVT Protocols.
15.	Weed management of Trials	Managed in line with minimum requirements as per NVT Protocols.
16.	Weed management of Trial pathways and headlands	Trial pathways or headlands to be effectively management for weeds.
17.	Visitor access to Sites facilitated	Access track is required if more than 100m from the access gate/road. Visitors can easily find the trial of interest at a multi-trial Site. Trials are readily visible from the closest road (including formed and stable in-farm access routes) unless negotiated otherwise with the NVT manager prior to sowing. Visible GRDC/NVT signage is displayed.
18.	Trial pathway management	Trial pathways are sprayed/slashed, are straight, and harvestable plot lengths are accurately measured and are of uniform length in line with the requirements of the NVT Protocols.

19.	Trial plot lengths	Harvestable plot lengths are measured, and data entered in to the NVT database in line with the requirements of the NVT Protocols.
20.	Canola Trials are desiccated or windrowed	Canola Trials are desiccated or windrowed in accordance with agreed benchmark maturity varieties in line with the requirements of the NVT Protocols.
21.	Required Soil test data captured and uploaded for each trial as per the NVT protocols	Soil test and Predicta B results uploaded to the NVT database in line with the requirements of the NVT Protocols.
22.	Temperature data provided for all Sites captured and uploaded for each trial	Tiny tag temperature data is provided for all sites in line with the requirements of the NVT Protocols.
23.	Flowering growth stage data is collected as per the NVT Protocols	Days to flowering/heading data (50% flowering/heading) to be recorded and uploaded to the NVT database in line with the requirements of the NVT Protocols.
		Growth stage data to be recorded and uploaded to the NVT database in line with the requirements of the NVT Protocols
24.	Trial harvest direction is uniform	Trials are to be harvested in the one direction, not serpentine or circular.
25.	Trial harvest management	Harvest is conducted to ensure all varieties are adequately harvested in line with the requirements of the NVT Protocols.
26.	Trial abandonment indication	Trials to be considered for abandonment due to quality control concerns are immediately flagged to the NVT Manager in line with the requirements of the NVT Protocols.
27.	Self-reporting trial issues impacting trial outcomes, e.g. establishment, pests, chemical damage, harvest issues	Trial Service Provider notifies NVT of compromised trials that have the potential to result in invalid variety comparisons, trial abandonment or reputational risk to GRDC in line with the requirements of the NVT Protocols.
28	Management of abandoned Trials	Abandoned Trials managed in line with the requirements of the NVT Protocols.
29.	Data Entry Dates	Data is entered to the NVT database in line with the requirements of the NVT Protocols.
30.	Data Entry Completeness	Data is entered to the NVT database in line with the requirements of the NVT Protocols.
31.	Data Entry Quality	Data entered into the NVT database is accurate and free of errors.
32.	Engagement with NVT Advisory Committee (NAC) and NVT Management Committee	Attendance at NVT Advisory Committee and NVT Management Committee.
33.	Grain quality Data	Grain quality analysis conducted in line with the requirements of the NVT Protocols.
34.	Grain Quality Laboratory equipment serviced and calibrated annually.	Grain quality laboratory equipment serviced and calibrated annually in line with the requirements of the NVT Protocols.
35.	Trial is successfully completed in accordance with all NVT Protocols	All critical Trial Data is delivered in accordance with Service standards and as per NVT Protocols.
36.	Covariate Capture – Trial Service Provider identified	Trial Service Provider identifies and captures relevant covariates and enters into database for inclusion in the analysis. Covariates are captured accurately.

37.	Covariate Capture – NVT requested	Where directed by the NVT Manager, the Trial Service Provider
		captures relevant covariates and enters into database for
		inclusion in the analysis.
		Covariates are captured accurately.

10 APPENDIX B – NVT NOMINATION AND SEED DELIVERY DATES

Crop and Series	Nominations open	Nominations close (Nomination Date)	Nominations finalised (confirmation to dispatch seed)	Seed to be delivered by (Delivery Date)*	First Potential trial sown
Wheat - long & early series	20-Feb	1-Mar	7-Mar	20-Mar	1-Apr
Wheat - main	20-Feb	1-Mar	7-Mar	1-Apr	22-Apr
Durum	20-Feb	1-Mar	7-Mar	1-Apr	22-Apr
Barley	20-Feb	1-Mar	7-Mar	1-Apr	15-Apr
Oat	20-Feb	1-Mar	7-Mar	1-Apr	22-Apr
Canola	20-Feb	1-Mar	7-Mar	25-Mar	7-Apr
Chickpea	20-Feb	1-Mar	7-Mar	1-Apr	22-Apr
Faba Bean	20-Feb	1-Mar	7-Mar	1-Apr	15-Apr
Field Pea	20-Feb	1-Mar	7-Mar	1-Apr	1-May
Lentil	20-Feb	1-Mar	7-Mar	1-Apr	1-May
Lupin	20-Feb	1-Mar	7-Mar	1-Apr	15-Apr

Note - Breeders are required to supply Seed of newly commercialised open pollinated

cultivars to the NVT Seed Bulk Up providers by 1 April each year.

*TSP has right to sow without varieties if seed is delivered late.

11 APPENDIX C – CHAIN OF CUSTODY FORM

		NVT CH			M						
COC Con Note/Tracking #			Commercia	I Durum Lines							
Freight/Courier Co:											
TRANSFER FROM				TRANSFER TO				IALS			
Organisation Name:	0			NVT Service Prov	ider :						
Seed Dispatch Address:	0			Contact Person:		. <u></u>					
Suburb:	0			Seed Receival A	ddress:						
State/Territory:	0			Address 1	Address 1						
Postal Code:	0		Address 2								
Contact Person(s):	0			Phone#:		Email address:					
Phone#: 0	Email addres	is O		NVT Contact Pers	son(s):	Ben O'Connor	ben.oconnor	@grdc.com.au			
Prepared by:		date	time	Received by:				date	time		
Sent by:		date	time	Authorised Servic	e Provider Represe	ntative:		date	time		
Authorised Company Represente	ative:	date	time	NVT Manager Confirmation:				date	time		
Comments/Irregularities observed	d relevant to NVT Trial	s by Receiver:									

	SAMPLE INFORMATION							SAMPLE QUALITY ASSURANCE (Attach relevant documentation)			
Seed Package Identifier	Crop Species	Crop Type (eg Clearfield)	Germplasm Identifier	GMO (Yes/No)	OGTR DIR#	Phytosanitary Compliance with recipient state law	Seed Purity Declaration (presence of weeds)	Germination (%)	1000 Seed Weight	Seed Vol (kg)	NOTES
[≫] NVT	WNT Online www.nvtonline.com.au grdc.com.au										

12 APPENDIX D – MATERIAL TRANSFER AGREEMENT

NVT Material Transfer Agreement – Key Terms

The following terms must be incorporated into any Material Transfer Agreement used for the purposes of the NVT program. Breeders and Service Providers are able to agree on additional terms or use their own templates on condition that the terms specified below are incorporated and not contradicted.

1.1 Definitions

Breeder means the entity that provides the Material.

Chain of Custody Form means the Chain of Custody Form included in the NVT Protocols

Material means the material provided to the Service Provider and specified in the Chain of Custody Form

NVT means National Variety Trials being the national program of evaluation trials for commercially bred crops administered by GRDC.

NVT Manager means the person nominated by the GRDC from time to time as being responsible for overall management of NVT.

Protocols means the guidelines and protocols for the management of NVT as published on the GRDC web site www.grdc.com.au from time to time.

Service Provider means the entity that receives the Materials for evaluation.

Third party researcher means research organisations, Government agencies and departments.

1.2 The Breeder warrants:

- (1) it is the owner of the Material or has the necessary authority to provide the Material to the Services Provider;
- (2) it will provide the Material to the Service Provider as specified in the Chain of Custody Form
- (3) the Material has been accepted into the NVT in accordance with the Protocols.

1.3 The Service Provider must:

- (1) issue a receipt to the Breeder, detailing the Material received from the Breeder, within a reasonable time period after receiving the Material;
- (2) only use the Material for the purposes of evaluation undertaken in relation to NVT, where directed by GRDC provide the Material to Third party researchers to undertake research approved by the NVT Manager, and otherwise use the Material in accordance with the Protocols;

- (3) treat reports and other data relating to the evaluation as confidential and only provide such reports and data to the NVT Manager;
- (4) store and maintain the Material at its own expense from the date of transfer;
- (5) comply with all applicable laws, regulations and codes of conduct relating to use of the Material;
- (6) ensure the Material is covered under its normal insurance arrangements;
- (7) destroy or return the Material, and seed progeny of the Material, as directed by the Breeder, in accordance with the Protocols.

1.4 The Service Provider acknowledges that:

- (1) this Agreement does not transfer any intellectual property or ownership rights in the Material, or its genetic parts or components; and
- (2) it will be responsible for the Material received from the Breeder and will ensure the Material is managed in accordance with the Protocols.

1.5 The Parties acknowledge that:

- (1) The Service Provider will not be liable for any claims or losses to the extent they are caused by the Breeder's negligence or breach of its warranties.
- (2) The Breeder will not be liable for any claims or losses to the extent they are caused by the Service Provider's negligence, breach of the Material Transfer Agreement or breach of the Protocols.

13 APPENDIX E – NVT TRIAL AUDITING

E.1 Audit Process

(1) Every trial will be audited at least once by the GRDC NVT regional manager or a nominated contracted expert on behalf of GRDC. All auditors undertake the audits in the strictest of independence. The findings of the audit will determine inclusion or exclusion of a trial to the data set, and additionally inform milestone achievement and KPI delivery of Trial Service Providers.

E.2 NVT Site Audit Sheet

The site audit sheet is to assess trial accessibility, operational management and factors that will affect the quality of the trial. Circle a value for each criterion, where **9** = very good and **1** = very poor.

Asse	ssor:	Da	nte:				
Crop	/Trial ID:	Trial Location:					
Site	Selection						
a)	Appropriate signage at site TRUE / NVT signage displayed at roadside or entry point /	FALSE	e)	Plot one identified White peg or similar in plo	TRUE t one	/ FALSE	
b)	GPS coordinates supplied, accurate TRUE / GPS coordinates accurate to reach trial site	FALSE	f)	Tinytag in place Tinytag/Weather station ir	TRUE place with w	/ FALSE eather shield	
c)	Site Location Trials are easily accessible and not too far from main/acco Trials are sown within 25km of specified town/location.	ess road. A	9 ccess no	876543 It limited by 4WD only, or wat	21 terway crossin	NA g, etc.	
d)	Site Selection Trials are not inhibited by site selection issues e.g. sown r	near tree lir	9 ne, sowi	876543 n on headland, uneven soil typ	21 be or topograp	NA ^{bhy}	
Sow	ing						
a)	Timing Trials sown within appropriate germination window or wi	ithin 10 day	9 s of far	876543 mer/district crops	21	NA	
b)	Driving Accuracy Trial has uniform plot spacing between rows, i.e. not too	close toget	9 her of f	876543 ar apart. Trial pathways are st	21 rraight	NA	
c)	Missing Rows All plots have same number of rows planted, with no bloo *Provide details of number of reps/plots and number of r	cked hoses. rows missin	9 ig plants	876543 ; in General Comments.	21	NA	
d)	Tripping Evenness of tripping across trial. Issues where seed runs i	into next pl	9 ot or wl		d with plot tri	NA mming	
e)	Emergence Even emergence, uniform establishment across trial and	within plots	9 s, appro	876543 priate plant density. Trials are	e established a	NA is per target plants/m ²	
f)	Sowing Errors Varieties in trial match those shown in Plot Layout field p	lan. Lamina	9 ated Plo	876543 t Layout/Field Plan provided a	at trial site	NA	
Mar	nagement						
a)	Disease Control Trials are free of diseases that can be actively managed i.	e. stripe ru	9 st in wh	876543 eat, leaf rust in barley, etc.	21	NA	
b)	Pest Control Trials are free of pests that can be actively managed i.e. s	nails and sl	9 ugs, ap	876543 nids, mice, etc.	21	NA	
c)	Weed Control Trials are weed free, relative to the farmers surrounding	crop, headl	9 ands ar	876543 e also managed appropriately	21	NA	
d)	Plot Trimming Either slashed or sprayed. Issues may be not straight path	ns (uneven	9 plot len	876543 gths), spray drift into plots.	21	NA	
e)	Crop Health Trial is in good condition, adequate nutrients applied, hea	althy colour	9 r, height		21	NA	
f)	Site Cleanup Trial site has been left in clean, tidy condition. Weeds mir	nimised in s	9 surround	876543 Jing areas	21	NA	
Gen	eral Comments:						

Please return via email to a GRDC/NVT staff member or L

14 APPENDIX F – STANDARD OPERATING PROCEDURES

F.1 Tinytag Data Loggers

(1) Aim: To obtain minimum and maximum temperature data at NVT trial sites to assist in assessing heat stress.



Unit: Tinytag Data Logger, Model # TGP-4017

- (2) A Stevenson type screen is required to protect Tinytags and must be supplied by the Trial Service Provider. The ACS-5050 Stevenson Type Screen is designed to protect Tinytag data loggers from adverse conditions when used in outdoor monitoring applications. The screen protects units from radiant heat (direct sunlight) and precipitation, whilst allowing air to circulate freely.
- (3) Tinytags are to be mounted within a trial at a standard height of 1.2 meter to give uniformity over all NVT sites. The stake must be of robust construction to ensure it can be supported firmly in the soil to avoid wind causing damage to Tinytags and mounts, maintaining an upright position for the duration of the season.
- (4) Tags should be set to take a temperature reading at 15-minute intervals when in the field. Temperature data must be captured from day of sowing to harvest date. Data should be retrieved, saved, and then cleared off the Tinytags every season. Batteries need replacing every season as well. All Tinytags need to be clearly labelled with the site name before being placed in the field.





F.2 Predicta B Sampling

Winter rainfall cropping regions

The following guidelines have been prepared by the Predicta B laboratory at SARDI to assist researchers collecting soil samples from the Southern Region, Western Region and Northern Region south of Dubbo.

Materials

NVT Barcoded sample bags supplied by SARDI

PREDICTA B approved soil corer 10 mm X 100 mm, can be obtained from Russell.burns@sa.gov.au

Clean bucket

Esky, no ice

Express post or courier samples to;

Attn Russell Burns, SARDI Plant Research Centre, 2B Hartley Grove, URRBRAE SA 5064

Site characterisation

- (1) Ensure corer is clean before use. Re-clean before moving to a new site.
- (2) Use PREDICTA B Research soil bags assigned to the NVT program; the barcode is linked to this activity.
- (3) Make sure you record the barcode and site details.
- (4) Select **15** locations on a grid to represent the site (Figure 1), and at each location collect **3** cores targeting rows of previous crop if visible (Figure 2). The site sample will comprise **45** cores.
- (5) Ensure each core is full before adding to the bucket; discard part-filled cores and repeat.
- (6) At each location add **1** piece of cereal stubble **5** cm long from the base of the plant; stubble may be 1 to 4 years old
- (7) Retain all material collected in the core; do NOT clear soil surface before coring.
- (8) Pool the 45 cores and 15 pieces of stubble in the same bucket, then transfer to the barcoded sample bag; if sampling instructions are followed the sample dry weight should be around 500g (without sub-sampling).
- (9) Store samples in an empty esky (no ice) to protect from direct sunlight.
- (10) Dispatch samples to SARDI as soon as possible, if short term storage necessary, store at 5°C, do not freeze.

Plot sampling

If sampling individual plots, refer to sampling protocols on PIRSA website, <u>https://www.pir.sa.gov.au/research/services/molecular_diagnostics/predicta_research</u>. Larger diameter 14 mm X 100 mm soil corer can be used to collect 20 cores per plot and can be obtained from <u>Russell.burns@sa.gov.au</u>

Characterising a trial site

Select the trial site and identify 15 locations on a grid to represent the site (Figure 1). At each of the 15 locations collect 3 cores (Figure 2).



Figure 1.

Choose 15 locations on a grid that best represents designated trial site; example displayed for a rectangle site.



Figure 2.

Take three cores at each grid location; locate each core about 1 meter from the central location and target previous rows if visible.

Summer rainfall cropping regions

The following guidelines have been prepared by the Predicta B laboratory at SARDI to assist researchers collecting samples from the Northern Region (north of Dubbo) prior to sowing a pulse crop in order to obtain a consistent measure of disease risk.

Materials

Barcoded sample bags supplied by SARDI in 2020

PREDICTA B approved soil corer **10 mm X 150 mm**; Foot stomper or AccuCore contact Russell.burns@sa.gov.au

Clean bucket

Esky, no ice

Express post or courier samples to;

Attn Russell Burns, SARDI Plant Research Centre, 2B Hartley Grove, URRBRAE SA 5064

Site characterisation

- (1) Ensure corer is clean before use. Re-clean before moving to a new site.
- (2) Use PREDICTA Research soil bags assigned to the NVT program in 2020; the barcode is linked to this activity.
- (3) Make sure you record the barcode and site details.
- (4) Select **15** locations on a grid to represent the site (Figure 1), and at each location collect **2** cores targeting rows of previous crop if visible (Figure 2). The total site sample will comprise **30** cores.
- (5) Ensure each core is full before adding to the bucket; discard part-filled cores and repeat.
- (6) At each location add **1** piece of cereal stubble **5**cm long from the base of the plant; stubble may be 1 to 4 years old
- (7) Retain all material collected in the core; do NOT clear soil surface before coring.
- (8) Pool the 30 cores and 15 pieces of stubble in the same bucket, then transfer to the barcoded sample bag; if sampling instructions are followed the sample dry weight should be around 500g (without sub-sampling).
- (9) Store samples in an empty esky (no ice) to protect from direct sunlight.
- (10) Dispatch samples to SARDI as soon as possible, if short term storage necessary, store at 5°C, do not freeze.

Plot sampling

If sampling individual plots, refer to sampling protocols on PIRSA website, https://www.pir.sa.gov.au/research/services/molecular_diagnostics/predicta_research . Larger diameter AccuCore 12 mm X 150 mm cores can be used to collect 20 cores per plot; can be obtained from Russell.burns@sa.gov.au.

Characterising a trial site

Select the trial site and identify 15 locations on a grid to represent the site (Figure 1). At each of the 15 locations collect 2 cores (Figure 2).



Figure 1.

Choose 15 locations on a grid that best represents designated trial site; example displayed for a rectangle site.



Figure 2.

Take two cores at each grid location; locate each core about 1 meter from the central location and target previous rows if visible.

F.3 Soil Testing

- (1) The site must have a uniform soil depth and texture and representative soil samples must be taken.
- (2) Follow Fertcare guidelines for soil testing.
 - (a) A guide for fit for purpose soil sampling produced by Fertcare_provides all the necessary detail on creating a representative sample for analysis.
- (3) A soil test is required at every site
- (4) The soil testing depths required per region are:

NORTH & SOUTH & WEST	
0- 10cm,	
10-60cm,	

(5) Tests required

- (a) Top 10cm
 - (i) Colour and texture
 - (ii) Gravel (%)
 - (iii) Ammonium N, Nitrate N Phosphorus (Colwell) Phosphorus Buffer Index (PBI)
 - (iv) Potassium (Colwell)
 - (v) Exchangeable Cations (Ca, K, Mg, Na)
 - (vi) Exchangeable Aluminium
 - (vii) Sulphur (KCl 40^oC)
 - (viii) pH (1:5 water) & pH (1:5 CaCl2)
 - (ix) Electrical Conductivity (1:5 water)
 - (x) Organic Carbon (Walkley & Black)
 - (xi) Boron
- (b) Deep soil 10-60cm
 - (i) Texture and Colour
 - (ii) Gravel (%)
 - (iii) Ammonium N, Nitrate N
 - (iv) Exchangeable cations (Ca, K, Mg, Na)
 - (v) Exchangeable Aluminium
 - (vi) Sulphur (KCl 40^oC)
 - (vii) pH (1:5 water) & pH (1:5 CaCl2)
 - (viii) Electrical Conductivity (1:5 water)
 - (ix) Boron

F.4 Trial Measurements Table

Activity	Description	Measurement	Requirement	Potential
		ant		(Y or N)
Bird or animal damage (pre- harvest)	A visual assessment is to be made based on total plot area of those plants that have been affected by vermin damage.	% of total plot	As required	Ŷ
	harvest.			
Chemical damage	A visual assessment is to be made based on total plot area suffering from chemical damage that will likely affect yield	% severity	As Required	Y
Disease	A visual assessment is to be made based on total plot area suffering from the disease that will affect yield	% severity Disease type	As Required	Y
	Capture and report disease incidence type. If required, send to relevant approved pathology for accurate diagnostics via plating or pathology.			
	*Note all sites should be managed as per trial management in the NVT 2020 document noting that a trial should not be compromised by disease damage			
	100%= is total expected yield loss.			
Establishment	A visual assessment is to be made based on what percentage of the target total plant population has been achieved Use maximum internal % of 5	% of target population	Every trial	Y
	to tillering.			
Establishment plant count	Physically count 3 x 1m randomly selected rows within each individual plot	Number/square metre	As requested by NVT Manager when trial issue	Y
	Convert plants per metre count based on row spacing into number of plants per square metre.			
Grain Quality Impurities	A visual assessment is to be made based on the percentage of impurities that remain in the grain quality sample. For example, % of	% of grain quality sample	As required – if any seasonal or management factors have	Ν

Activity	Description	Measurement unit	Requirement	Potential Covariate? (Y or N)
	cracked grain in the screenings sample.		influenced the trial results.	
Growth stage	Take a single Zadoks or growth stage rating for each plot in the period from the beginning of flowering up until the start of early dough in cereals or beginning of early pod fill in pulses/canola of the quickest goalpost cultivar.	Zadoks for cereals, BBCH decimal for other crops	Every trial	N
Harvest desiccation	If a trial is to be desiccated, it is to be done at the appropriate time and in accordance with the chemical manufacturers' instructions. The correct time for desiccation is when 70–80% of seeds have changed colour in middle pods. The crop will be ready to harvest within 4–7 days after the desiccant is applied, depending on the size and density of the crop.			N
Harvest Direction	Trials are to be harvested in the same direction, not in a serpentine or 'up and back' direction.			N
Harvest Length	The longest two sides of a plot (that must be equal) and must be measured with a GPS or hand measuring tape and document into the NVT database.	Metres	Every trial	N
Harvest Width	This will be calculated by the measurement between plot centres, and the whole plot is harvested.	Metres	Every trial	N
Head loss	A visual assessment is to be made based upon the total amount of heads lost to the ground This measurement is to be taken at harvest. 100% = no heads being left on plants for harvest.	% of affected heads per plot	As required	Y
Height	Choose a representative area of the plot to take the height measurement. With a measuring device (ruler, tape measure, infrared tool, etc.) capture the average plant height.	cm	Opportunistic	N

Activity	Description	Measurement unit	Requirement	Potential Covariate? (Y or N)
	The height measurement will be taken between full head emergence and harvest.			
Insect damage	A visual assessment is to be made based on total plot area suffering from the pest that will affect yield. Capture and report insect type. *Note all sites should be managed as per trial management in the NVT 2020 document noting that a trial should not be compromised by pest damage 100%= is total expected yield loss.	% severity Insect type	As Required	Y
Lodging score	If any lodging has occurred at the site a rating must be taken of all plots. Provide a % score of plants in the plot that have lodged (not fully erect) and % score of severity of lodging. 100% of plants = every plant lodged 100% severity = plants lying flat on ground Timing to be done at harvest.	% of plants of the total plot that have lodged. % severity	As required	N
Missing Row length Per Plot	Where part or all of any row in a plot is missing due to seeder malfunction or no emergence, measure the length of the missing row, or rows added together.	Metres	As Required	Y
Number of rows in a plot	ber of rows Enter into the NVT database lot simply the number of rows in the width of the plot (as row spacings may be different between crops).		Every trial	N
Other Trial Measurements	Detail what is being measured in Comments 100%= is total expected yield loss.	% plot affected or severity		
Plot integrity Capturing Patchiness & uniformity	A visual assessment is to be made based on total plot area. 100%= no factors have affected the plot other than the expression of genetics.	% area of totally effective plot	As Required	Y
Rainfall	Report into the NVT Database as a monthly rainfall measurement. Ideally the nearby growers rain gauge should be used to collect	Monthly mm	Every trial	N

Activity	Description	Measurement unit	Requirement	Potential Covariate? (Y or N)
	monthly rainfall and proximity from the actual site noted in kilometres from trial in a straight line. As a last resort the local BOM records can be used.			
Shattering score	Take a visual assessment of how much grain has fallen out of the heads prior to harvest and not able to be captured at harvest. 100% = all grain in the plot is on the ground Data to be captured at harvest.	% of total grain loss onto the ground for the area of plot	As Required	Y
Waterlogging	A visual assessment is to be made based on total plants within plot area suffering from waterlogging that may affect yield Measurement to be taken during or immediately after waterlogging event. 100%= is total expected yield loss.	% severity	As Required	Y
Weed contamination	A visual assessment is to be made based on total impact of weed presence has had on possible yield potential of the total plot Capture and report weed type *Note all sites should be managed as per trial management in the NVT 2020 document noting that a trial should not be compromised by weed damage 100%= is total expected yield loss.	% severity	As Required	Y
Yield of trial	Harvest and weigh the total area of the nominated plot size. Report the weight of the plot. Harvested grain from each plot must be separately and accurately weighed, preferably on site, but if off site then a foolproof system of bagging and labelling must be instituted. Data pertaining to harvesting must be uploaded to the NVT database by the NVT Service Provider immediately following and no longer than 7 days following harvest date.	Kg per plot	Every trial	N

15 APPENDIX G – GRAIN QUALITY ASSESSMENTS AND SOPS

G.1 Sampling Notes

- (1) Grain quality assessment within NVT will be largely based on assessment relative to trade/market specifications, as developed and published by Grain Trade Australia (GTA).
- (2) Prior to grain quality assessment, samples are to be cleaned (aspirated) without removal of whole grain i.e. free of chaff, awns, cracked grain and other impurities. Barley is to be de-awned prior to testing.
 - (a) Remaining impurities must be measured and recorded in the NVT database (e.g. % of cracked grain in the screenings sample).
- (3) Quality testing is to be conducted using equipment and procedures approved for the relevant trade specification by GTA. (Use of any alternatives equipment requires approval by the NVT manager).

Crop	Protein	Oil	Moisture	Test Weight	Screenings	Retention	Grain Weight	Colour
Wheat	% "as is"		% "as is"	kg/hl	%<2.0mm sieve		g/1000 seeds	
Oat	% "as is"		% "as is"	kg/hl	%<2.0mm sieve		g/1000 seeds	
Barley	% "as is"		% "as is"	kg/hl	%<2.2mm sieve	%>2.5mm sieve	g/1000 seeds	Minolta L*
Canola	% "as is"	% "as is"	% "as is"					
Pulses							g/100 seeds	

G.2 Quality Analysis Testing Required for NVT

G.3 Moisture Assessments

Wheat, Barley, Oats and Canola

- (1) Definition
 - (a) This describes the NIR method for determination of moisture in cereal and canola grains.
- (2) Apparatus
 - (a) NIR instrument approved by the National Measurement Institute for use for trade urposes under the conditions stipulated in:
 - (i) NMI V10 (Uniform Test Procedures for the Verification, Certification and In-Service Inspection of Protein Instruments for Grain.
 - (ii) NMI M8 (Pattern Approval Specifications for Protein Measuring Instruments for Grain.
- (3) Procedure

- (a) Sample will be cleaned (aspirated) without removal of whole grain i.e. free of chaff, awns, cracked grain and other impurities.
- (b) Individual manufacturer instructions and procedures should be followed for operation and maintenance of NIR instruments used to determine grain moisture.
- (c) Report result to the nearest 0.1% on 'as is' basis.
- (4) References.
 - (a) NMI M 8 Pattern Approval Specifications for Protein Measuring Instruments for Grain.
 - (b) NMI V10 Uniform Test Procedures for the Verification, Certification and In-Service Inspection of Protein Instruments for Grain.

G.4 Protein Assessments

Wheat, Barley, Oats and Canola.

- (1) Definition
 - (a) This describes the NIR method for determination of protein in cereal and canola grains.
- (2) Apparatus
 - (a) NIR instrument approved by the National Measurement Institute for use for trade purposes under the conditions stipulated in:
 - (i) NMI V10 (Uniform Test Procedures for the Verification, Certification and In-Service Inspection of Protein Instruments for Grain.
 - (ii) NMI M8 (Pattern Approval Specifications for Protein Measuring Instruments for Grain.

(3) Procedure

- (a) Sample will be cleaned (aspirated) without removal of whole grain i.e. free of chaff, awns, cracked grain and other impurities.
- (b) Individual manufacturer instructions and procedures should be followed for operation and maintenance of NIR instruments used to determine Protein.
- (c) Report result to the nearest 0.1% on 'as is' basis.
- (4) References.
 - (a) NMI M 8 Pattern Approval Specifications for Protein Measuring Instruments for Grain.
 - (b) NMI V10 Uniform Test Procedures for the Verification, Certification and In-Service Inspection of Protein Instruments for Grain.

G.5 Oil Assessment of Canola

- (1) Definition
 - (a) This describes the NIR method for determination of oil in canola.
- (2) Apparatus

- (a) NIR instrument approved by the National Measurement Institute for use for trade purposes under the conditions stipulated in:
 - (i) NMI V10 (Uniform Test Procedures for the Verification, Certification and In-Service Inspection of Protein Instruments for Grain.
 - (ii) NMI M8 (Pattern Approval Specifications for Protein Measuring Instruments for Grain.
- (3) Procedure
 - (a) Sample will be cleaned (aspirated) without removal of whole grain i.e. free of chaff, cracked grain and other impurities.
 - (b) Individual manufacturer instructions and procedures should be followed for operation and maintenance of NIR instruments used to determine Oil.
 - (c) Report result to the nearest 0.1% on 'as is' basis.

G.6 Test Weight Assessment - Schopper Chondrometer

Schopper Chondrometer Reference Method

Wheat, Barley and Oats

- (1) Definition
 - (a) This describes the chondrometer methods for determination of test weight (bushel weight/hectolitre weight) in cereal grains.
- (2) Apparatus
 - (a) 1L Schopper Calibrated Chondrometer (cylinders)
 - (b) Plastic bowl
 - (c) Analytical balance accurate to at least 0.01g

(3) Procedure



- (a) Secure bottom half of cylinder A to base plate on the chondrometer box.
- (b) Ensure the sliding divider C is in the slot on cylinder A.
- (c) Place weight D on top of sliding divider.
- (d) Secure top half of cylinder B to the bottom half A.
- (e) Ensure the slider is closed and pour grain in the cylinder at a constant rate until full to the top.
- (f) Pull the sliding divider out and the weight will move down, drawing the grain down with it (you will hear it moving down).
- (g) Once the weight D is at the bottom, replace the sliding divider back in the slot.
- (h) Carefully tip the cylinder upside down and tip out all the grain remaining above the divider. Make sure to catch the weight D as it drops down.
- (i) Place a plastic container on the electric balance and tare to read zero.
- (j) Remove the blade from the chondrometer and tip the measured litre of grain into the plastic container and weigh.
- (k) The weight is in grams and needs to be multiplied by 0.1 (divided by 10) to obtain a density in kg/hl.
- (I) Always undertake analysis in duplicate and average results.
- (m) Report the result to two decimal places.
- (4) References
 - (a) Test Weight Per Bushel AACC Method 55-10
 - (b) National Measurement Institute General Certificate of Approval No 4/10/0A

G.7 Test Weight Assessment - Franklin Mark II Chondrometer

Franklin Mark II Chondrometer Reference Method

- (1) Definition
 - (a) This is the Franklin Mark II Chondrometer reference method to determine the density of cereal grains (otherwise known as the test weight) expressed as kilograms per hectolitre.
- (2) Apparatus
 - (a) Franklin Mark 11 Chondrometer Drop Weight Trade Certified Chondrometer
 - (b) Pre Filling Cup
- (3) Procedure
 - (a) Assemble the instrument together and place the calibration weight onto the top of the measuring cylinder.
 - (b) Place the measuring cylinder with weight on the hook at the end of the measuring beam.

- (c) Calibrate the instrument by moving the sliding weight to the position corresponding to 40kg/hl on the measuring beam. The beam should balance equidistantly between the top and bottom of the square space at the other end of the beam.
- (d) If the beam is not balanced, turn the calibration screw at the other end of the beam until the correct setting is achieved.
- (e) Remove the calibration weight. The instrument is then calibrated.
- (f) Insert the cutter bar into the bottom measuring cylinder and place the drop weight on top of the cutter bar.
- (g) Fit the top filling cylinder onto the measuring cylinder.
- (h) Fill the prefilling cup with grain.
- (i) Steadily pour the grain from the prefilling cup with one hand into the top filling cylinder until it is full whilst holding both cylinders together.
- (j) Withdraw the cutter bar in a single swift motion.
- (k) Re-insert the cutter in the slit and push it through the grain with a single firm stroke.
- (I) Remove the top filling cylinder from the measuring cylinder and discard the grain remaining above the cutter, while holding the cutter in place.
- (m) Remove the cutter and suspend the measuring container from the measuring beam of the chondrometer.
- (n) Adjust the sliding weight on the beam until the instrument is balanced.
- (o) Read the test weight of the graduated balance beam at the point indicated by the sliding weight and record the result in kilograms per hectolitre.
- (p) Report the result to two decimal places.
- (4) References
 - (a) Test Weight Per Bushel AACC Method 55-10
 - (b) ISO7971-2
 - (c) National Measurement Institute General Certificate of Approval No 4/10/0A

G.8 Test Weight Assessment - Kern 222 Chondrometer

Kern 222 Chondrometer Reference Method

- (1) Definition
 - (a) This is the Kern 222 Trade Certified Chondrometer reference method to determine the density of cereal grains (otherwise known as the test weight) expressed as kilograms per hectolitre.
- (2) Apparatus.

- (a) Kern 222 Trade Certified Chondrometer with valid Regulation 13 certificate.
- (b) Analytical balance accurate to at least 0.01g
- (3) Procedure
 - (a) Assemble the measuring container with the grain cutter inserted in the slit. Place the brass piston on top of the cutter blade. Connect the filling hopper securely on the top of the measuring container.
 - (b) Fill the pre-filling cup with grain.
 - (c) Steadily pour the grain from the pre-filling cup into the filling hopper until the filling hopper is full.
 - (d) Grasp the measuring container firmly with one hand and with the other hand withdraw the cutter in a single swift motion.
 - (e) Re-insert the grain cutter in the slit and push it through the grain with a single firm stroke.
 - (f) Remove the filling hopper from the measuring container and discard the grain remaining above the cutter, while holding the cutter in place.
 - (g) Remove the cutter and return the base bucket to an upright position and then withdraw the cutter.
 - (h) Place the Steel Bowl onto the balance and press the T (Tare) button, ensure Zeros are displayed.
 - (i) Pour the grain from the bucket into the steel bowl.
 - (j) The weight in grams will appear on the display of the balance. This figure is referred to as the weight in grams per litre.
 - (k) All numerical results are to be written down to two decimal places.
- (4) References
 - (a) ISO Method 7971-2
 - (b) National Measurement Institute General Certificate of Approval No 4/10/0A

G.9 Screenings Assessment - Wheat, Oats and Sorghum

- (1) Definition
 - (a) This is the reference method used to determine the percentage by weight of Screenings (%grain <2.0mm wide).
- (2) Apparatus
 - (a) Agtator Shaking Device.
 - (b) Analytical balance accurate to at least 0.01g.

- (c) 2.00mm Screen displaying annual certification sticker with the following specifications:
- (d) 300mm diameter discs x 0.9mm stainless steel, perforated with 12.7mm x 2.00mm slots, hit and miss on ends with 4.77mm end bar and 2.0mm side bar.
- (3) Procedure
 - (a) Obtain a certified half litre sample of grain.
 - (b) Place the 2.00mm screen on top of the Agtator platform with the slots aligned toward the front of the Agtator. Ensure the screen is clean, smooth, dry and free of grain residues in the slots.
 - (c) Ensure the Agtator is set to perform 40 to and fro movements over a period of approximately 68 seconds.
 - (d) Pour the half litre of grain in one movement onto the screen surface. No additional movement or spreading of the sample over the screen is to occur.
 - (e) Turn on the Agtator and allow it to run until the 40 movements have been completed.
 - (f) Gently remove the screen and pan from the Agtator and detach the screen from the pan.
 - (g) Calculate Screenings percentage Weigh the contents of the pan on an appropriate top pan balance and calculate the percentage as follows:

Screenings by wt (%) = <u>Screenings Weight X 100</u> Total Weight

(h) Report all results to the nearest 0.1%.

G.10 Screenings Assessment - Barley

- (1) Definition
 - (a) This is the reference method used to determine the percentage by weight of Unmillable Material Below the 2.2mm Screen (Screenings), including Small Foreign Seeds and reference method used to determine grain retained above the 2.50mm screen, referred to as retention (plumpness).
- (2) Apparatus
 - (a) Agtator Shaking Device.
 - (b) Analytical balance accurate to at least 0.01g.
 - (c) Combination of two screens top 2.50mm top screen and 2.20mm bottom screen displaying annual certification sticker with the following specifications:

- (i) 300mm diameter discs x 0.9mm stainless steel, perforated with 25.40mm x 2.50mm slots, hit and miss on ends with 4.77mm end bar and 2.0mm side bar.
- (iii) 300mm diameter discs x 0.9mm stainless steel, perforated with 25.40mm x 2.20mm slots, hit and miss on ends with 4.77mm end bar and 2.0mm side bar.
- (3) Procedure
 - (a) Obtain a certified half litre sample of grain.
 - (b) Place the 2.20mm and 2.50mm screens on top of the Agtator platform with the slots aligned toward the front of the Agtator. Ensure the barley screen is clean, smooth, dry and free of grain residues in the slots.
 - (c) Ensure the Agtator is set to perform 40 to-and-fro movements over a period of approximately 68 seconds.
 - (d) Pour the half litre of grain in one movement onto the screen surface. No additional movement or spreading of the sample over the screen is to occur.
 - (e) Turn on the Agtator and allow it to run until the 40 movements have been completed.
 - (f) Gently remove the screen and pan from the Agtator and detach the screen from the pan.
 - (g) Calculate Screenings:
 - (i) **For all states:** (<2.2 mm sieve) percentage Weigh the contents of the pan from below the 2.2 mm sieve on an appropriate top pan balance and calculate the percentage as follows:

Screenings (<2.2 mm sieve) by wt (%) = (<u>Screenings Weight/Total Weight)x100</u>

Report all results to the nearest 0.1%.

(h) Calculate Retention percentage (all states) - Weigh the grain remaining above the 2.5 mm screen on an appropriate top pan balance and calculate the percentage as follows:

Retention by wt (%) = (grain above the 2.5mm sieve/total weight) x100

Report all results to the nearest 0.1%.

G.11 Thousand Grain Weight Assessment – Cereals.

Wheat, Barley and Oats.

- (1) Definition
 - (a) Thousand grain weight (TGW) is an important grain characteristic. The traditional measurement method relies on manual steps:
- (2) Apparatus
 - (a) Counting

- (i) As manual counting is time-consuming and labor-intensive with subjective results, electronic counting devices can be used e.g. Contador Seed counter
- (b) Weighing
 - (i) Analytical balance accurate to at least 0.01g.
- (3) Procedure
 - (a) Program equipment for a total of 1,000 grains/kernels.
 - (b) Capture 1,000 grains.
 - (c) Place weighing container on appropriate top pan balance and tare to zero.
 - (d) Pour 1,000 grains into container and record weight to 0.01g

G.12 Hundred Grain Weight Assessment – Pulses

Chickpea, Faba Bean, Field Pea, Lentil and Lupins.

- (1) Definition
 - (a) Hundred grain weight (HGW) is an important grain characteristic. The traditional measurement method relies on manual steps:
- (2) Apparatus
 - (a) Counting
 - (i) As manual counting is time-consuming and labor-intensive with subjective results, electronic counting devices can be used e.g. Contador seed counter.
 - (b) Weighing.
 - (i) Analytical balance accurate to at least 0.01g to be used for weighing.
- (3) Procedure
 - (a) Program equipment for a total of 100 grains/kernels.
 - (b) Capture 100 grains.
 - (c) Place weighing container on appropriate top pan balance and tare to zero.
 - (d) Pour 100 grains into container and record weight to 0.01g.

G.13 Colour Assessment - Barley (WA Only)

Barley grain colour is an important trait in assessing grain quality, indicating the extent of bleaching and staining due to preharvest weather conditions.

- (1) Definition
 - (a) This describes the NIR method for determination of Grain colour in Barley (WA).
- (2) Apparatus

- (a) NIR instrument available for hire by Co-Operative Bulk Handling Ltd. (CBH)
 - (i) CBH annually certified and calibrated to colour reference samples.
- (b) Other NIR instruments able to be calibrated for colour determination using CBH calibration algorithms (as supplied by CBH).
- (3) Procedure
 - (a) Sample must be de-awned and cleaned (aspirated) without removal of whole grain i.e. free of chaff, cracked grain and other impurities.
 - (b) Individual manufacturer instructions and procedures should be followed for operation and maintenance of NIR instruments used to determine grain colour.
 - (c) Report results to the nearest whole number.

16 APPENDIX H – CROP SPECIFIC PROTOCOLS

Crop Specific Protocol tables are designed to be a template whereby the Regional NVT Committee, and other NVT stakeholders, can provide input (where required) to determine the best agronomic framework for managing trials. These are likely to be updated as needed (at least yearly). The purpose of the crop specific protocol is to provide a standardised national approach to key management criteria specific to a crop type.

If intending to work outside any of these guidelines seek input from your Regional NVT Committee and seek approval from your GRDC NVT Regional Manager.

H.1 Barley						
Criteria	Comments					
Nutrition	Nutrition application to be informed by soil testing					
	The trial must not be limited by any nutrient					
	Nitrogen to be managed to achieve 11% protein					
	Phosphorus not to be limited					
	Zinc & Manganese to be applied in high pH soils >pH 7 in CaCl2					
	Zinc amended fertiliser in SA, VIC and WA					
	Apply K and foliar trace elements (Zn, Mn, Cu) at mid-tillering as required					
Site selection	pH >4.5 preferably >5.5 and no acid sub soils					
	Avoid barley on barley rotation					
Sowing date	Refer to main NVT Protocol document					
Inter-plot distance at sowing	Inter-plot distance should be kept to a minimum, but sufficient to ensure that wheel tracks do not encroach upon adjoining plots.					
Seed dressing	Use regional best practice					
	Systiva and Gaucho as per label					
Seeding fungicide	In-furrow fungicide:					
	 Uniform as per label recommendation (WA) Impact as per label recommendation (SA, VIC, NSW, QLD) 					
Target plant	All rainfall zones: 120 - 180 plants/m2					
practice within population range)	Target 150 plants/m2 plus or minus 30 plants/m2 on district best practice					
Required	All products must be applied as per label recommendation					
ngicides notes (best practice)	Overwatch (bixlozone) herbicide should not be applied to NVT barley trials given elevated sensitivities of some lines.					
	If resistant ryegrass is expected to be present, use a pre-emergent residual grass herbicide					
	Monitor and measure insect and weed populations and apply pesticide/herbicide according to best local practice for individual crop types					
	Multiple fungicide applications will be required for disease control and timings should be aimed at both early and late goal post varieties to ensure the range of maturities are covered at optimal timings within the trial.					
Harvest notes	Desiccation not required; harvest at 12.5% moisture; avoid skinning at harvest					

H.2 Canola						
Criteria	Comments					
Nutrition	Nutrition application to be informed by soil testing					
	The trial must not be limited by any nutrient					
	Nitrogen management to aim for 80 kg of available Nitrogen per forecast tonne of yield.					
	No Nitrogen fertiliser with the seed – must be placed away from the seed, preferred spread or deep banded					
	Maximum of 15kg of P at seeding, preferred spread or deep banded					
	Apply S and foliar trace elements (Zn, Mn, Cu) as required					
Site selection	pH >4.5 preferably >5.5 and no acid sub soils					
GMO presence outside of Glyphosate trials	Where a Glyphosate canola trial series is not present at a location, it is the responsibility of the TSP to ensure an appropriate management plan is inplace with the agreement of the trial co-operator, for the presence of genetically modified varieities from stacked lines in the IMI or TT trials.					
Sowing dates	Refer to main NVT Protocol document					
Seed dressing	Sow bare seed - without fungicide seed dressing					
Seeding fungicide	In-furrow fungicide Flutriafol as per label recommendation					
Inter-plot distance at sowing	Inter-plot distance should be increased to 500 mm to minimise cross plot entanglement and ease harvest, particularly in potentially high yield situations.					
Target plant establishment (plants per m2)	Low-Med Rainfall – 40/m2 Med-High Rainfall – 50/m2					
Required herbicide/insecticide/fun gicide notes	Glyphosate canola trial series are to be managed using the standards suitable for Roundup Ready [®] Canola systems. Use a bare earth PSPE insecticide					
	Apply snail/slug/mouse pellets where appropriate use moisture resistant baits at max label rate for longevity of treatment. Reapply when required.					
	If resistant ryegrass is expected to be present, use a pre-emergent residual grass herbicide request resistance test if available					
	 Clethodim timing <u>no later than</u>: *Rates are for 240g/L formulations Low-Med Rainfall trials – 500mL* rate – no later than 4 leaf Low-Med Rainfall trials – 250mL* rate – no later than 6 leaf Med-High Rainfall trials – 500mL* rate – no later than 6 leaf Med-High Rainfall trials – 250mL* rate – no later than 8 leaf 					

Criteria	Comments							
	Low-Med Rainfall – Hyola 350 TT							
	Med-High Rainfall – InVigor T4510							
	All products must be applied as per label recommendation							
	Apply fungicides in a pre-emptive strategy for sclerotinia and aerial blackleg prone regions. Multiple fungicide applications may be required to ensure all cultivar maturities are adequately managed within the goal post varieties (APPENDIX I – GOAL POST VARIETIES (MATURITY WINDOWS).							
	If resistant ryegrass is expected to be present, use a pre-emergent residual grass herbicide							
	Monitor and measure insect and weed populations and apply pesticide/herbicide according to best local practice for individual crop types							
Harvest Methods	(a) Windrowing, If a trial is to be windrowed it must be done at the appropriate growth stage and in such a way that crop material is not carried between plots or blown away in strong wind events.							
	(b) Desiccation, and							
	(c) Direct heading: Where a trial is to be direct headed, great care must be taken to prevent excessive yield or quality loss during harvest. The application of products that reduce shattering of pods at harvest may be beneficial.							
Desiccation & harvest notes	Apply desiccant (Diquat) at appropriate timing for desiccation cultivar standard APPENDIX I – GOAL POST VARIETIES (MATURITY WINDOWS).label withholding periods must be strictly adhered to							
	Harvest at 8% moisture or less							
	Pod Ceal [®] or equivalent product is recommended in high-risk shattering environments							

H.3 Chickpea, Faba Bean, Field Pea, Lentil

Criteria	Comments
Nutrition	Nutrition application to be informed by soil testing
	The trial must not be limited by any nutrient
	Alkaline fertiliser such as DAP are preferred as they have less impact on seed inoculants and fertiliser should be separated from the seed at sowing
	A minimum of 10kg/ha of P to be applied
	Ensure adequate Zn, S and Mn at sowing
Site selection	pH > 5.5 preferable pH > 6
	Plots to be rolled after seeding as this reflects commercial operations, particularly in cloddy and stony soils
	Where lentil and other pulse trials are co-located, if possible, the trials should be located in a lentil paddock.
Sowing dates	Refer to main NVT Protocol document
Seed dressing	Follow regional best practice for individual Pulse crop types for individual seasons as outlined by GRDC or state agricultural research department
	Apply both a fungicide and an insecticide registered seed dressing
Rhizobial Inoculation	Apply <u>2 times</u> recommended rate of either liquid in furrow inoculant or dry granular inoculant (weighed at seed packing, distributed evenly in cone of seeder)
	Seed coated inoculant is not recommended
Seeding notes	Inter-plot distance should be kept to a minimum, but sufficient to ensure that wheel tracks do not encroach upon adjoining plots for erect crop types.
	Inter-plot distance should be increased to 500 mm in spreading crop types e.g. Field Peas to ease harvest and especially in potentially high yield situations. Where situations may result in a cloddy seedbed, surface rolling after seeding is recommended. This may improve herbicide efficacy eg Metribuzin but will assist harvest of peas and lentils where very low harvest cutter bar height is needed.
Target plant establishment (plants	Chickpea Desi: 35-45 Chickpea Kabuli: 30
per m2)	Faba Bean: 25-35 Field pea: 55
	Lentil: 120
Required herbicide/	All products must be applied as per label recommendation
insecticide/rungicide	Multiple fungicide applications may be required as should ensure all cultivar maturities (fastest and slowest) are adequately managed

Criteria	Comments
	Monitor and measure insect and weed populations and apply pesticide/herbicide according to best local practice for individual crop types
	Follow BMP for disease management strategies for individual crop types. Apply fungicides in a pre-emptive strategy for prevalent diseases with multiple fungicide application required for optimal timing for goal post varieties.
	Pay particular attention to Native budworm / Heliothis control in spring
	For the Imi tolerant Lentil trial series it is recommended that imi herbicide is applied, however in sites of low weed pressure, or residue it is not mandatory and will be left at TSP discretion.
Pre-Harvest plot check	All trailing type and spreading crops, e.g. Field Peas, trials should be checked for potential cross plot entanglement at the commencement of pod fill. Where cross plot entanglement is evident, the vines should be "rolled/flicked" back into the respective plot using a broom stick or something similar that does not knock off pods or break plant parts in the morning when plants are flaccid and more malleable. Regular walking up and down the plot rows in pea trials and separating gently with hands or boots during the growing season helps to prevent complex and severe entanglement in most cases and can reduce the need for late season disentanglement practices.
Harvest notes	Pulse crop harvest is one of the most critical elements of producing accurate and reliable pulse data due to inherent limitations and fragilities of the individual crop species when compared with some cereals eg wheat. A high level of competent operator experience to set up and conduct harvesting operations is required along with appropriate plot harvesting machinery and/or modifications for each individual crop species. Standard wheat harvesting machinery and operations are not sufficient. Desiccation/crop topping is recommended, and must be applied as per label recommendation and strictly adhering to MRL levels
	Harvest should ensure all grain is harvested including low pods.
	Avoid harvest contamination including soil and other foreign material. If required, harvest samples should be cleaned and reweighed
	Refer to Section 7.1 for further harvest details.

H.4 Lupin						
Criteria	Comments					
Nutrition	Nutrition application to be informed by soil testing					
	The trial must not be limited by any nutrient					
	No P or K fertiliser to be sown with the seed					
	No lime applied before sowing					
	P preferably banded below seed					
	On manganese responsive soils (sandy soils) apply manganese fertiliser with the P fertiliser (banded below the seed) and/or spray manganese foliar when the pods on the primary stem are 2.5cm long					
Site selection	Select sites with low broadleaf weed burden					
	Preferably sow into cereal stubble					
Sowing dates	Refer to main NVT Protocol document					
Seed dressing	Iprodione (e.g. Rovral) + Thiram as per label recommendation					
Rhizobial Inoculation	Apply 2x recommended rate of either liquid in furrow inoculant or dry granular inoculant (weighed at seed packing, distributed evenly in cone of seeder)					
	Seed coated inoculant is not recommended					
Inter-plot distance at sowing	Inter-plot distance should be kept to a minimum, but sufficient to ensure that wheel tracks do not encroach upon adjoining plots and cross plot entanglement does not occur especially in potentially high yield situations.					
Target minimum plant	Lupin: 45/m2					
m2)	Avoid sowing lupins too deep on heavier soil types					
Required	All products must be applied as per label recommendation					
gicide notes	No grass selective herbicides later than 2 weeks prior to first flower					
	Pay particular attention to Native budworm / Heliothis control in spring					
	Metribuzin can only be applied if Regional NVT Manager confirms that n Metribuzin sensitive varieties are present in trials					
	Monitor and measure insect and weed populations and apply pesticide/herbicide according to best local practice for individual crop types					
	Where fungicides are recommended for disease control, multiple applications will be required to optimise timings for the goalpost varieties APPENDIX I – GOAL POST VARIETIES (MATURITY WINDOWS).					
Harvest notes	Where desiccation required, apply Diquat at crop maturity					

Criteria		Comments
	harvest at <14% moisture	

H.5 Oat							
Criteria	Comments						
Nutrition	Nutrition application to be informed by soil testing						
	The trial must not be limited by any nutrient						
	Nitrogen to be managed to achieve 11% protein						
	Phosphorus not to be limited						
	Zinc amended fertiliser in SA, VIC and WA; and Copper in WA						
	Apply K and foliar trace elements (Zn, Mn, Cu) at mid-tillering as required						
Site selection	pH > 4.5 preferably >5.5 and no acid sub soils						
Sowing dates	Refer to main NVT Protocol document						
Seed dressing	Use regional best practice.						
	Evergol Energy and Gaucho as per label rates						
Seeding fungicide	As required, use regional best practice						
	In-furrow fundicide:						
	 Uniform as per label recommendation (WA) 						
	 Impact as per label recommendation (SA, VIC, NSW, QLD) 						
Inter-plot distance at	Inter-plot distance should be kept to a minimum, but sufficient to ensure						
sowing	that wheel tracks do not encroach upon adjoining plots.						
Target plant	LRZ (<350 mm): 110 - 160						
establishment (use local	MRZ: 160 - 200 HRZ (>500 mm): 200 - 240						
population range)	TIKZ (~300 mm). 200 - 240						
Required herbicide/insecticide/fun	All products must be applied as per label recommendation						
gicide notes (best practice)	Use industry best practice however avoid use of trifluralin						
	If resistant ryegrass is expected to be present, use a pre-emergent						
	residual grass herbicide						
	Monitor and measure insect and weed populations and apply						
	pesticide/herbicide according to best local practice for individual crop types						
	Apply fungicides in a pre-emptive strategy for prevalent diseases,						
	multiple applications of fungicides will be required to achieve optimal						
	timing for the range of maturities within the goal post varieties APPENDIX I – GOAL POST VARIETIES (MATURITY WINDOWS).						
Harvest notes	Desiccation not required; harvest at 12.5% moisture						

H.6 Wheat						
Criteria	Comments					
Nutrition	Nutrition application to be informed by soil testing					
	The trial must not be limited by any nutrient					
	Nitrogen to be managed to achieve 12% protein					
	Phosphorus not to be limited					
	Zinc amended fertiliser in SA, VIC and WA; and Copper in WA					
	Apply K and foliar trace elements (Zn, Mn, Cu) at mid-tillering as required					
Site selection	pH >4.5 preferably >5.5 and no acid sub soils					
Sowing dates	Refer to main NVT Protocol document					
Seed dressing	Evergol Energy as per label rate					
	Gaucho as per label rate					
	Apply insecticide for management of RWA					
Seeding fungicide	In-furrow fungicide:					
	Uniform as per label recommendation (WA)					
	 Impact as per label recommendation (SA, VIC, NSW, QLD) 					
Inter-plot distance at	Inter-plot distance should be kept to a minimum, but sufficient to ensure					
sowing	that wheel tracks do not encroach upon adjoining plots.					
Target plant	LRZ (<350 mm): 100 - 160					
establishment (use local	MRZ: 160 - 200					
practice within population range)	HRZ (>500 mm): 200 – 240					
Required	All products must be applied as per label recommendation					
gicide notes	If resistant ryegrass is expected to be present, use a pre-emergent					
(best practice)	residual grass herbicide					
	Monitor and measure insect and weed populations and apply					
	pesticide/herbicide according to best local practice for individual crop types					
	Apply fungicides in a pre-emptive strategy for prevalent diseases.					
	multiple applications of fungicides will be required to achieve optimal					
	timing for the range of maturities within the goal post varieties (see					
	тваррепах н, pg 89).					
Harvest notes	Desiccation not required; harvest at 12.5% moisture					

17 APPENDIX I – GOAL POST VARIETIES (MATURITY WINDOWS).

The following table provides details of the target maturity windows for each NVT trial type and region for all crops and desiccation standards where appropriate

State	Сгор	Season/Type	Region	Desiccation Standard	Quick Boundary	Slow Boundary
VIC	Barley	Long	South West		RGT Planet	Oxford/Alestar
SA	Barley	Long	South East		RGT Planet	None
TAS	Barley	Long	Northern Midlands		RGT Planet	Oxford/Alestar
NSW	Barley	Main	N/E		Compass / Spartacus	Westminster/Oxford
NSW	Barley	Main	N/W		None	Commander
NSW	Barley	Main	S/E		Compass / Spartacus	Westminster/Oxford
NSW	Barley	Main	S/W		Compass / Yeti	Commander/RGT Planet
QLD	Barley	Main	CQ - Dawson		Compass / Yeti	Rosalind/Laperouse
QLD	Barley	Main	CQ - Highland		Compass / Yeti	Rosalind/Laperouse
QLD	Barley	Main	SEQ		Compass	Westminster/Oxford
QLD	Barley	Main	SWQ		Compass	Westminster/Oxford
SA	Barley	Main	Lower EP		Compass	Westminster/Oxford
SA	Barley	Main	Mid North		None	Westminster/Oxford
SA	Barley	Main	Murray Mallee		None	Commander/RGT Planet
SA	Barley	Main	South East - Lower		Compass/Spartacus	Westminster/Oxford
SA	Barley	Main	South East - Upper		Compass/Spartacus	Westminster/Oxford
SA	Barley	Main	Upper EP		Compass	Commander/RGT Planet
SA	Barley	Main	Yorke P		Compass	Westminster/Oxford
VIC	Barley	Main	Mallee		Compass	Commander
VIC	Barley	Main	North Central		Compass	Westminster/Oxford
VIC	Barley	Main	North East		Compass	Westminster/Oxford
VIC	Barley	Main	Wimmera		Compass	Westminster/Oxford
WA	Barley	Main	Agzone1		Spartacus	Commander/RGT Planet
WA	Barley	Main	Agzone2		Spartacus	Commander
WA	Barley	Main	Agzone3		Compass/Spartacus	Westminster/Oxford
WA	Barley	Main	Agzone4		Spartacus	Commander/RGT Planet
WA	Barley	Main	Agzone5		Spartacus	Westminster/Oxford
WA	Barley	Main	Agzone6		Compass/Spartacus	Westminster/Oxford

State	Crop	Season/Type	Region	Desiccation Standard	Quick Boundary	Slow Boundary
ALL	Canola	Low-Med Rainfall	ALL	Invigor T4510	N/A	N/A
ALL	Canola	Med-High Rainfall	ALL	HyTTech Trifecta	N/A	N/A
NSW	Chickpea	Desi	N/E	PBA HatTrick	CBA Captain	PBA Drummond
NSW	Chickpea	Desi	N/W	PBA HatTrick	CBA Captain	PBA Drummond
NSW	Chickpea	Desi	S/W	PBA Slasher	PBA Striker	PBA Boundary
QLD	Chickpea	Desi	CQ	Kyabra	PBA Pistol	PBA Drummond
QLD	Chickpea	Desi	SEQ	PBA HatTrick	CBA Captain	PBA Boundary
QLD	Chickpea	Desi	SWQ	PBA HatTrick	CBA Captain	PBA Boundary
SA	Chickpea	Desi	Yorke P	PBA Slasher	PBA Striker	
VIC	Chickpea	Desi	Mallee	PBA Slasher	PBA Striker	
VIC	Chickpea	Desi	Wimmera	PBA Slasher	PBA Striker	
WA	Chickpea	Desi	Agzone1	PBA Slasher	PBA Striker	
WA	Chickpea	Desi	Agzone2	PBA Slasher	PBA Striker	
WA	Chickpea	Desi	Agzone4	PBA Slasher	PBA Striker	
WA	Chickpea	Desi	Agzone5	PBA Slasher	PBA Striker	
WA	Chickpea	Desi	Ord	PBA HatTrick	PBA Pistol	PBA Drummond
NSW	Chickpea	Kabuli	N/W	Genesis - 090	PBA Monarch	Genesis Kalkee
SA	Chickpea	Kabuli	Yorke P	Genesis - 090	PBA Monarch	Genesis Kalkee
VIC	Chickpea	Kabuli	Mallee	Genesis - 090	PBA Monarch	Genesis Kalkee
VIC	Chickpea	Kabuli	Wimmera	Genesis - 090	PBA Monarch	Genesis Kalkee
WA	Chickpea	Kabuli	Ord	Genesis - 090	PBA Monarch/Kimberley Large	Genesis Kalkee
NSW	Faba Bean	Main	N/E	PBA Zahra	PBA Nanu	
NSW	Faba Bean	Main	N/W	PBA Zahra	PBA Nanu	
NSW	Faba Bean	Main	S/W	PBA Zahra	PBA Marne	PBA Zahra
QLD	Faba Bean	Main	SWQ	PBA Zahra	PBA Nanu	
SA	Faba Bean	Main	Lower EP	PBA Zahra	PBA Marne	PBA Zahra
SA	Faba Bean	Main	Mid North	PBA Zahra	PBA Marne	PBA Zahra
SA	Faba Bean	Main	Murray Mallee	PBA Zahra	PBA Marne	PBA Zahra

State	Сгор	Season/Type	Region	Desiccation Standard	Quick Boundary	Slow Boundary
SA	Faba Bean	Main	South East	PBA Zahra	PBA Marne	PBA Zahra
SA	Faba Bean	Main	Yorke P	PBA Zahra	PBA Marne	PBA Zahra
VIC	Faba Bean	Main	North East	PBA Zahra	PBA Marne	PBA Zahra
VIC	Faba Bean	Main	South West	PBA Zahra	PBA Marne	PBA Zahra
VIC	Faba Bean	Main	Wimmera	PBA Zahra	PBA Marne	PBA Zahra
WA	Faba Bean	Main	Agzone3	PBA Zahra	PBA Marne	PBA Zahra
WA	Faba Bean	Main	Agzone5	PBA Zahra	PBA Marne	PBA Zahra
NSW	Field Pea	Main	S/E	PBA Butler	GIA Kastar	Kaspa
NSW	Field Pea	Main	S/W	PBA Butler	GIA Kastar	Kaspa
SA	Field Pea	Main	Lower EP	PBA Butler	GIA Kastar	Kaspa
SA	Field Pea	Main	Mid North	PBA Butler	GIA Kastar	Kaspa
SA	Field Pea	Main	Murray Mallee	PBA Butler	GIA Kastar	Kaspa
SA	Field Pea	Main	South East	PBA Butler	GIA Kastar	Kaspa
SA	Field Pea	Main	Upper EP	PBA Butler	GIA Kastar	Kaspa
SA	Field Pea	Main	Yorke P	PBA Butler	GIA Kastar	Kaspa
VIC	Field Pea	Main	Mallee	PBA Butler	GIA Kastar	Kaspa
VIC	Field Pea	Main	Wimmera	PBA Butler	GIA Kastar	Kaspa
WA	Field Pea	Main	Agzone1	PBA Butler	GIA Kastar	Kaspa
WA	Field Pea	Main	Agzone2	PBA Butler	GIA Kastar	Kaspa
WA	Field Pea	Main	Agzone3	PBA Butler	GIA Kastar	Kaspa
WA	Field Pea	Main	Agzone4	PBA Butler	GIA Kastar	Kaspa
WA	Field Pea	Main	Agzone5	PBA Butler	GIA Kastar	Kaspa
NSW	Lentil	Main	S/E	PBA Hurricane XT	PBA Blitz	PBA Ace
SA	Lentil	Main	Lower EP	PBA Hurricane XT	PBA Blitz	PBA Ace
SA	Lentil	Main	Mid North	PBA Hurricane XT	PBA Blitz	PBA Ace
SA	Lentil	Main	Murray Mallee	PBA Hurricane XT	PBA Blitz	РВА Асе
SA	Lentil	Main	South East	PBA Hurricane XT	PBA Blitz	РВА Асе

State	Сгор	Season/Type	Region	Desiccation Standard	Quick Boundary	Slow Boundary
SA	Lentil	Main	Yorke P	PBA Hurricane XT	PBA Blitz	РВА Асе
VIC	Lentil	Main	Mallee	PBA Hurricane XT	PBA Blitz	РВА Асе
VIC	Lentil	Main	Wimmera	PBA Hurricane XT	PBA Blitz	PBA Ace
WA	Lentil	Main	Agzone1	PBA Hurricane XT	PBA Blitz	PBA Ace
WA	Lentil	Main	Agzone2	PBA Hurricane XT	PBA Blitz	PBA Ace
WA	Lentil	Main	Agzone3	PBA Hurricane XT	PBA Blitz	PBA Ace
WA	Lentil	Main	Agzone5	PBA Hurricane XT	PBA Blitz	PBA Ace
NSW	Lupin	Narrow Leafed	N/W	Coyote	Mandellup	Wonga
NSW	Lupin	Narrow Leafed	S/E	Coyote	Mandellup	Wonga
SA	Lupin	Narrow Leafed	Lower EP	Coyote	Mandellup	Wonga
SA	Lupin	Narrow Leafed	Mid North	Coyote	Mandellup	Wonga
SA	Lupin	Narrow Leafed	Murray Mallee	Coyote	Mandellup	Wonga
SA	Lupin	Narrow Leafed	South East	Coyote	Mandellup	Wonga
VIC	Lupin	Narrow Leafed	Mallee	Coyote	Mandellup	Wonga
WA	Lupin	Narrow Leafed	Agzone1	Coyote	Mandellup	Wonga
WA	Lupin	Narrow Leafed	Agzone2	Coyote	Mandellup	Wonga
WA	Lupin	Narrow Leafed	Agzone4	Coyote	Mandellup	Wonga
NSW	Oat	Main	N/E		Yallara	Koala/Bannister
NSW	Oat	Main	S/E		Yallara	Koala/Bannister
NSW	Oat	Main	S/W		Yallara	Koala/Bannister
SA	Oat	Main	Mid North		Yallara	Koala/Bannister
SA	Oat	Main	Murray Mallee		Yallara	Koala/Bannister
SA	Oat	Main	South East		Yallara	Koala/Bannister
SA	Oat	Main	Upper EP		Yallara	Koala/Bannister
SA	Oat	Main	Yorke P		Yallara	Koala/Bannister
VIC	Oat	Main	North Central		Yallara	Koala/Bannister

State	Сгор	Season/Type	Region	Desiccation Standard	Quick Boundary	Slow Boundary
VIC	Oat	Main	North East		Yallara	Koala/Bannister
VIC	Oat	Main	South West		Yallara	Koala/Bannister
WA	Oat	Main	Agzone2		Yallara	Koala/Bannister
WA	Oat	Main	Agzone3		Yallara	Koala/Bannister
WA	Oat	Main	Agzone4		Yallara	Koala/Bannister
WA	Oat	Main	Agzone5		Yallara	Koala/Bannister
WA	Oat	Main	Agzone6		Yallara	Koala/Bannister
NSW	Wheat	Early	N/E		Gregory/Coota	Sunmax
NSW	Wheat	Early	N/W		Gregory/Coota	Sunmax
NSW	Wheat	Early	S/E		Reliant/Trojan	Sunmax/Illabo
NSW	Wheat	Early	S/W		Reliant/Trojan	Sunmax/Illabo
QLD	Wheat	Early	SEQ		Gregory/Coota	Sunmax
QLD	Wheat	Early	SWQ		Gregory/Coota	Sunmax/Illabo
SA	Wheat	Early	Murray Mallee		Yitpi/Gregory	Sunmax/Illabo
SA	Wheat	Early	South East - Lower		Yitpi/Gregory	Sunmax/Illabo
SA	Wheat	Early	Upper EP		Yitpi/Gregory	Sunmax/Illabo
VIC	Wheat	Early	Mallee		Yitpi/Gregory	Sunmax/Illabo
VIC	Wheat	Early	North Central		Yitpi/Gregory	Sunmax/Illabo
VIC	Wheat	Early	North East		Yitpi/Gregory	Sunmax/Illabo
VIC	Wheat	Early	South West		Yitpi/Gregory	Sunmax/Illabo
VIC	Wheat	Early	Wimmera		Yitpi/Gregory	Sunmax/Illabo
WA	Wheat	Early	Agzone1		Yitpi/Gregory	Sunmax/Illabo
WA	Wheat	Early	Agzone2		Yitpi/Gregory	Sunmax/Illabo
WA	Wheat	Early	Agzone3		Yitpi/Gregory	Sunmax/Illabo
WA	Wheat	Early	Agzone4		Yitpi/Gregory	Sunmax/Illabo
WA	Wheat	Early	Agzone5		Yitpi/Gregory	Sunmax/Illabo
WA	Wheat	Early	Agzone6		Yitpi/Gregory	Sunmax/Illabo
NSW	Wheat	Long	N/E		Sunmax/Illabo	N/A

State	Сгор	Season/Type	Region	Desiccation Standard	Quick Boundary	Slow Boundary
NSW	Wheat	Long	S/E		Sunmax/Illabo	N/A
TAS	Wheat	Long	Northern Midlands		Sunmax/Illabo	N/A
SA	Wheat	Long	S/E		Sunmax/Illabo	N/A
VIC	Wheat	Long	South West		Sunmax/Illabo	N/A
NSW	Wheat	Main	N/E		Vixen/Sunprime	Yitpi/Gregory/Coota
NSW	Wheat	Main	N/W		Vixen/Sunprime	Yitpi/Gregory/Coota
NSW	Wheat	Main	S/E		Vixen/Sunprime	Reliant/Trojan
NSW	Wheat	Main	S/W		Vixen/Sunprime	Reliant/Trojan
QLD	Wheat	Main	CQ - Dawson		Vixen/Sunprime	Reliant/ Trojan/ Coota
QLD	Wheat	Main	CQ - Highland		Vixen/Sunprime	Reliant/Trojan/ Coota
QLD	Wheat	Main	SEQ		Vixen/Sunprime	Reliant /Trojan/ Coota
QLD	Wheat	Main	SWQ		Vixen/Sunprime	Reliant/Trojan/ Coota
SA	Wheat	Main	Lower EP		Vixen	Reliant/Sheriff/Trojan/ Rockstar
SA	Wheat	Main	Mid North		Vixen	Reliant/Sheriff/Trojan/ Rockstar
SA	Wheat	Main	Murray Mallee		Vixen	Reliant/Sheriff/Trojan/ Rockstar
SA	Wheat	Main	South East - Lower		Vixen	Reliant/Sheriff/Trojan/ Rockstar
SA	Wheat	Main	South East - Upper		Vixen	Reliant/Sheriff/Trojan/ Rockstar
SA	Wheat	Main	Upper EP		Vixen	Reliant/Sheriff/Trojan/ Rockstar
SA	Wheat	Main	Yorke P		Vixen	Reliant/Sheriff/Trojan/ Rockstar
VIC	Wheat	Main	Mallee		Vixen	Reliant/Sheriff/Trojan/ Rockstar
VIC	Wheat	Main	North Central		Vixen	Reliant/Sheriff/Trojan/ Rockstar
VIC	Wheat	Main	North East		Vixen	Reliant/Sheriff/Trojan/ Rockstar
VIC	Wheat	Main	Wimmera		Vixen	Reliant/Sheriff/Trojan/ Rockstar
WA	Wheat	Main	Agzone1		Vixen	Reliant/Sheriff/Trojan
WA	Wheat	Main	Agzone2		Vixen	Reliant/Sheriff/Trojan
WA	Wheat	Main	Agzone3		Vixen	Reliant/Sheriff/Trojan
WA	Wheat	Main	Agzone4		Vixen	Reliant/Sheriff/Trojan
WA	Wheat	Main	Agzone5		Vixen	Reliant/Sheriff/Trojan

State	Crop	Season/Type	Region	Desiccation Standard	Quick Boundary	Slow Boundary
WA	Wheat	Main	Agzone6		Vixen	Reliant/Sheriff/Trojan
NSW	Wheat/Durum	N/E	Durum		Jandaroi	Caparoi
NSW	Wheat/Durum	N/W	Durum		Jandaroi	Caparoi
NSW	Wheat/Durum	S/W	Durum		Jandaroi	Caparoi
QLD	Wheat/Durum	SEQ	Durum		Jandaroi	Caparoi
QLD	Wheat/Durum	SWQ	Durum		Jandaroi	Caparoi
SA	Wheat/Durum	Mid North	Durum		Saintly	DBAArtemis
SA	Wheat/Durum	Yorke P	Durum		Saintly	DBAArtemis
VIC	Wheat/Durum	Wimmera	Durum		Saintly	DBAArtemis

18 APPENDIX J.1 – TRIAL GERMINATION WINDOWS- BY CROP

Further information can be found in The Protocols under 5.6 Germination Windows

Legend: Preferred germination window (darker squares)

Legend: Unpreferred germination window (lighter squares)

Сгор	Series	State	Region	Apr	Apr	Apr	Apr	May	May	May	May	Jun	Jun	Jun	Jun
Barley	Long	VIC	South West												
Barley	Long	SA	South East												
Barley	Long	TAS	Northern Midlands												
Barley	Main	NSW	N/E												
Barley	Main	NSW	N/W												
Barley	Main	NSW	S/E												
Barley	Main	NSW	S/W												
Barley	Main	QLD	CQ - Dawson												
Barley	Main	QLD	CQ - Highland												
Barley	Main	QLD	SEQ												
Barley	Main	QLD	SWQ												
Barley	Main	SA	Lower EP												
Barley	Main	SA	Mid North												
Barley	Main	SA	Murray Mallee												
Barley	Main	SA	South East - Lower												
Barley	Main	SA	South East - Upper												
Barley	Main	SA	Upper EP												
Barley	Main	SA	Yorke P												
Barley	Main	VIC	Mallee												
Barley	Main	VIC	North Central												
Barley	Main	VIC	North East												
Barley	Main	VIC	Wimmera												
Barley	Main	WA	Agzone1												

Сгор	Series	State	Region	Apr	Apr	Apr	Apr	May	May	May	May	Jun	Jun	Jun	Jun
Barley	Main	WA	Agzone2												
Barley	Main	WA	Agzone3												
Barley	Main	WA	Agzone4												
Barley	Main	WA	Agzone5												
Barley	Main	WA	Agzone6												
Canola	Low-Med Rainfall	NSW	N/E												
Canola	Low-Med Rainfall	NSW	N/W												
Canola	Low-Med Rainfall	NSW	S/E												
Canola	Low-Med Rainfall	NSW	S/W												
Canola	Low-Med Rainfall	SA	Mid North												
Canola	Low-Med Rainfall	SA	Murray Mallee												
Canola	Low-Med Rainfall	SA	Upper EP												
Canola	Low-Med Rainfall	SA	Yorke P												
Canola	Low-Med Rainfall	VIC	Mallee												
Canola	Low-Med Rainfall	VIC	North Central												
Canola	Low-Med Rainfall	VIC	Wimmera												
Canola	Low-Med Rainfall	WA	Agzone1												
Canola	Low-Med Rainfall	WA	Agzone2												
Canola	Low-Med Rainfall	WA	Agzone3												
Canola	Low-Med Rainfall	WA	Agzone4												
Canola	Low-Med Rainfall	WA	Agzone5												
Canola	Low-Med Rainfall	WA	Agzone6												
Canola	Med-High Rainfall	NSW	N/E												
Canola	Med-High Rainfall	NSW	N/W												
Canola	Med-High Rainfall	NSW	S/E												
Canola	Med-High Rainfall	NSW	S/W												
Canola	Med-High Rainfall	NSW	SW (Irrigated)												
Canola	Med-High Rainfall	SA	Lower EP												
Canola	Med-High Rainfall	SA	Mid North												
Canola	Med-High Rainfall	SA	South East												

Crop	Series	State	Region	Apr	Apr	Apr	Apr	May	May	May	May	Jun	Jun	Jun	Jun
Canola	Med-High Rainfall	SA	Yorke P												
Canola	Med-High Rainfall	VIC	North Central												
Canola	Med-High Rainfall	VIC	North East												
Canola	Med-High Rainfall	VIC	North East (Irrigated)												
Canola	Med-High Rainfall	VIC	South West												
Canola	Med-High Rainfall	VIC	Wimmera												
Canola	Med-High Rainfall	WA	Agzone1												
Canola	Med-High Rainfall	WA	Agzone2												
Canola	Med-High Rainfall	WA	Agzone3									`			
Canola	Med-High Rainfall	WA	Agzone4												
Canola	Med-High Rainfall	WA	Agzone5												
Canola	Med-High Rainfall	WA	Agzone6												
Chickpea	Main	NSW	N/E												
Chickpea	Main	NSW	N/W												
Chickpea	Main	NSW	S/E												
Chickpea	Main	NSW	S/W												
Chickpea	Main	QLD	CQ - Dawson				_								
Chickpea	Main	QLD	CQ - Highland												
Chickpea	Main	QLD	SEQ												
Chickpea	Main	QLD	SWQ												
Chickpea	Main	SA	Lower EP												
Chickpea	Main	SA	Mid North												
Chickpea	Main	SA	Murray Mallee												
Chickpea	Main	SA	South East												
Chickpea	Main	SA	Upper EP												
Chickpea	Main	SA	Yorke P												
Chickpea	Main	VIC	Mallee												
Chickpea	Main	VIC	Wimmera												
Chickpea	Main	WA	Agzone1												
Chickpea	Main	WA	Agzone2												

Сгор	Series	State	Region	Apr	Apr	Apr	Apr	May	May	May	May	Jun	Jun	Jun	Jun
Chickpea	Main	WA	Agzone3												
Chickpea	Main	WA	Agzone4												
Chickpea	Main	WA	Agzone5												
Chickpea	Main	WA	Agzone6												
Faba Bean	Main	NSW	N/E												
Faba Bean	Main	NSW	N/W												
Faba Bean	Main	NSW	S/E												
Faba Bean	Main	NSW	S/W												
Faba Bean	Main	SA	Lower EP												
Faba Bean	Main	SA	Mid North												
Faba Bean	Main	SA	Murray Mallee												
Faba Bean	Main	SA	South East - Lower												
Faba Bean	Main	SA	South East - Upper												
Faba Bean	Main	SA	Upper EP												
Faba Bean	Main	SA	Yorke P												
Faba Bean	Main	VIC	North East												
Faba Bean	Main	VIC	South West												
Faba Bean	Main	VIC	Wimmera												
Faba Bean	Main	WA	Agzone3												
Faba Bean	Main	WA	Agzone5												
Field Pea	Main	NSW	N/E												
Field Pea	Main	NSW	N/W												
Field Pea	Main	NSW	S/E												
Field Pea	Main	NSW	S/W												
Field Pea	Main	SA	Lower EP												
Field Pea	Main	SA	Mid North												
Field Pea	Main	SA	Murray Mallee												
Field Pea	Main	SA	South East												
Field Pea	Main	SA	Upper EP												
Field Pea	Main	SA	Yorke P												

Сгор	Series	State	Region	Apr	Apr	Apr	Apr	May	May	May	May	Jun	Jun	Jun	Jun
Field Pea	Main	VIC	Mallee												
Field Pea	Main	VIC	North Central												
Field Pea	Main	VIC	South West												
Field Pea	Main	VIC	Wimmera												
Field Pea	Main	WA	Agzone1												
Field Pea	Main	WA	Agzone2												
Field Pea	Main	WA	Agzone3												
Field Pea	Main	WA	Agzone4												
Field Pea	Main	WA	Agzone5												
Field Pea	Main	WA	Agzone6												
Lentil	Main	NSW	S/E												
Lentil	Main	NSW	S/W												
Lentil	Main	SA	Lower EP												
Lentil	Main	SA	Mid North												
Lentil	Main	SA	Murray Mallee												
Lentil	Main	SA	South East												
Lentil	Main	SA	Upper EP												
Lentil	Main	SA	Yorke P												
Lentil	Main	VIC	Mallee												
Lentil	Main	VIC	North Central												
Lentil	Main	VIC	South West												
Lentil	Main	VIC	Wimmera												
Lentil	Main	WA	Agzone1												
Lentil	Main	WA	Agzone2												
Lentil	Main	WA	Agzone4												
Lentil	Main	WA	Agzone5												
Lupin	Main	NSW	N/E												
Lupin	Main	NSW	N/W												
Lupin	Main	NSW	S/E												
Lupin	Main	NSW	S/W												

Crop	Series	State	Region	Apr	Apr	Apr	Apr	May	May	May	May	Jun	Jun	Jun	Jun
Lupin	Main	SA	Lower EP												
Lupin	Main	SA	Mid North												
Lupin	Main	SA	Murray Mallee												
Lupin	Main	SA	South East												
Lupin	Main	SA	Upper EP												
Lupin	Main	SA	Yorke P												
Lupin	Main	VIC	Mallee												
Lupin	Main	VIC	North East												
Lupin	Main	VIC	South West												
Lupin	Main	VIC	Wimmera												
Lupin	Main	WA	Agzone1												
Lupin	Main	WA	Agzone2												
Lupin	Main	WA	Agzone3												
Lupin	Main	WA	Agzone4												
Lupin	Main	WA	Agzone5												
Lupin	Main	WA	Agzone6												
Lupin	Main	WA	Agzone7												
Lupin	Main	WA	Agzone8												
Oat	Main	NSW	N/E												
Oat	Main	NSW	N/W												
Oat	Main	NSW	S/E												
Oat	Main	NSW	S/W												
Oat	Main	SA	Lower EP												
Oat	Main	SA	Mid North												
Oat	Main	SA	Murray Mallee												
Oat	Main	SA	South East - Lower												
Oat	Main	SA	South East - Upper												
Oat	Main	SA	Upper EP					_							
Oat	Main	SA	Yorke P												
Oat	Main	VIC	Mallee												

Crop	Series	State	Region	Apr	Apr	Apr	Apr	May	May	May	May	Jun	Jun	Jun	Jun
Oat	Main	VIC	North Central												
Oat	Main	VIC	North East												
Oat	Main	VIC	South West												
Oat	Main	VIC	Wimmera												
Oat	Main	WA	Agzone2												
Oat	Main	WA	Agzone3												
Oat	Main	WA	Agzone4												
Oat	Main	WA	Agzone5												
Oat	Main	WA	Agzone6												
Wheat	Durum	NSW	N/E												
Wheat	Durum	NSW	N/W												
Wheat	Durum	NSW	S/W												
Wheat	Durum	QLD	CQ - Dawson					ļ							
Wheat	Durum	QLD	CQ - Highland												
Wheat	Durum	QLD	SEQ												
Wheat	Durum	QLD	SWQ												
Wheat	Durum	SA	Mid North				_								
Wheat	Durum	SA	Yorke P												
Wheat	Durum	VIC	Wimmera												
Wheat	Early	NSW	N/E												
Wheat	Early	NSW	N/W												
Wheat	Early	NSW	S/E												
Wheat	Early	NSW	S/W												
Wheat	Early	QLD	CQ - Dawson												
Wheat	Early	QLD	CQ - Highland												
Wheat	Early	QLD	SEQ												
Wheat	Early	QLD	SWQ												
Wheat	Early Break	SA	Murray Mallee												
Wheat	Early	SA	South East - Lower												
Wheat	Early Break	SA	Upper EP												

Crop	Series	State	Region	Apr	Apr	Apr	Apr	May	May	May	May	Jun	Jun	Jun	Jun
Wheat	Early Break	VIC	Mallee												
Wheat	Early Break	VIC	North Central												
Wheat	Early	VIC	North East												
Wheat	Early	VIC	South West												
Wheat	Early Break	VIC	Wimmera												
Wheat	Early Break	WA	Agzone1												
Wheat	Early Break	WA	Agzone2												
Wheat	Early Break	WA	Agzone3												
Wheat	Early Break	WA	Agzone4												
Wheat	Early Break	WA	Agzone5												
Wheat	Early Break	WA	Agzone6												
Wheat	Long	NSW	N/E												
Wheat	Long	NSW	S/E												
Wheat	long	SA	S/E												
Wheat	Long	TAS	Northern Midlands												
Wheat	Long	VIC	South West												
Wheat	Main	NSW	N/E												
Wheat	Main	NSW	N/W												
Wheat	Main	NSW	S/E					ļ							
Wheat	Main	NSW	S/W												
Wheat	Main	QLD	CQ - Dawson												
Wheat	Main	QLD	CQ - Highland												
Wheat	Main	QLD	SEQ												
Wheat	Main	QLD	SWQ					ļ							
Wheat	Main	SA	Lower EP												
Wheat	Main	SA	Mid North				_								
Wheat	Main	SA	Murray Mallee												
Wheat	Main	SA	South East - Lower												
Wheat	Main	SA	South East - Upper												
Wheat	Main	SA	Upper EP												

Crop	Series	State	Region	Apr	Apr	Apr	Apr	May	May	May	May	Jun	Jun	Jun	Jun
Wheat	Main	SA	Yorke P												
Wheat	Main	VIC	Mallee												
Wheat	Main	VIC	North Central												
Wheat	Main	VIC	North East												
Wheat	Main	VIC	Wimmera												
Wheat	Main	WA	Agzone1												
Wheat	Main	WA	Agzone2												
Wheat	Main	WA	Agzone3												
Wheat	Main	WA	Agzone4												
Wheat	Main	WA	Agzone5												
Wheat	Main	WA	Agzone6												

Note:

First box in each month refers to 1st-7th (inclusive) Final Box in each month refers to 22nd- 28, 30, or 31st

19 APPENDIX J.2 – TRIAL GERMINATION WINDOWS- BY STATE

Further information can be found in The Protocols under 5.6 Germination Windows

Legend: Preferred germination window (darker squares)

Legend: Unpreferred germination window (lighter squares)

WESTERN AUSTRALIA

	Region	Crop	Series	Apr	Apr	Apr	Apr	May	May	May	May	Jun	Jun	Jun	Jun
WA	Agzone1	Barley	Main												
WA	Agzone1	Canola	Low-Med Rainfall												
WA	Agzone1	Canola	Med-High Rainfall												
WA	Agzone1	Chickpea	Main												
WA	Agzone1	Field Pea	Main												
WA	Agzone1	Lentil	Main												
WA	Agzone1	Lupin	Main												
WA	Agzone1	Wheat	Early Break												
WA	Agzone1	Wheat	Main												
WA	Agzone2	Barley	Main												
WA	Agzone2	Canola	Low-Med Rainfall												
WA	Agzone2	Canola	Med-High Rainfall												
WA	Agzone2	Chickpea	Main												
WA	Agzone2	Field Pea	Main												
WA	Agzone2	Lentil	Main												
WA	Agzone2	Lupin	Main												
WA	Agzone2	Oat	Main												
WA	Agzone2	Wheat	Early Break												
WA	Agzone2	Wheat	Main												
WA	Agzone3	Barley	Main												
WA	Agzone3	Canola	Low-Med Rainfall												
WA	Agzone3	Canola	Med-High Rainfall									`			

WA	Agzone3	Chickpea	Main						
WA	Agzone3	Faba Bean	Main						
WA	Agzone3	Field Pea	Main						
WA	Agzone3	Lupin	Main						
WA	Agzone3	Oat	Main						
WA	Agzone3	Wheat	Early Break						
WA	Agzone3	Wheat	Main						
WA	Agzone4	Barley	Main						
WA	Agzone4	Canola	Low-Med Rainfall						
WA	Agzone4	Canola	Med-High Rainfall						
WA	Agzone4	Chickpea	Main						
WA	Agzone4	Field Pea	Main						
WA	Agzone4	Lentil	Main						
WA	Agzone4	Lupin	Main						
WA	Agzone4	Oat	Main						
WA	Agzone4	Wheat	Early Break						
WA	Agzone4	Wheat	Main						
WA	Agzone5	Barley	Main						
WA	Agzone5	Canola	Low-Med Rainfall						
WA	Agzone5	Canola	Med-High Rainfall						
WA	Agzone5	Chickpea	Main						
WA	Agzone5	Faba Bean	Main						
WA	Agzone5	Field Pea	Main						
WA	Agzone5	Lentil	Main						
WA	Agzone5	Lupin	Main						
WA	Agzone5	Oat	Main						
WA	Agzone5	Wheat	Early Break						
WA	Agzone5	Wheat	Main						
WA	Agzone6	Barley	Main						
WA	Agzone6	Canola	Low-Med Rainfall						
WA	Agzone6	Canola	Med-High Rainfall						
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WA	Agzone6	Chickpea	Main						
WA	Agzone6	Field Pea	Main						
WA	Agzone6	Lupin	Main Main						
WA	Agzone6	Oat	Main						
WA	Agzone6	Wheat	Early Break						
WA	Agzone6	Wheat	Main Main						
WA	Agzone7	Lupin	Main Main						
WA	Agzone8	Lupin	Main						

SOUTH AUSTRALIA

State	Region	Crop	Series	Apr	Apr	Apr	Apr	May	May	May	May	Jun	Jun	Jun	Jun
SA	Lower EP	Barley	Main												
SA	Lower EP	Canola	Med-High Rainfall												
SA	Lower EP	Chickpea	Main												
SA	Lower EP	Faba Bean	Main												
SA	Lower EP	Field Pea	Main												
SA	Lower EP	Lentil	Main												
SA	Lower EP	Lupin	Main												
SA	Lower EP	Oat	Main												
SA	Lower EP	Wheat	Main												
SA	Mid North	Barley	Main												
SA	Mid North	Canola	Low-Med Rainfall												
SA	Mid North	Canola	Med-High Rainfall												
SA	Mid North	Chickpea	Main												
SA	Mid North	Faba Bean	Main												
SA	Mid North	Field Pea	Main												
SA	Mid North	Lentil	Main												
SA	Mid North	Lupin	Main												
SA	Mid North	Oat	Main												

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SA	Mid North	Wheat	Durum						
SA	Mid North	Wheat	Main						
SA	Murray Mallee	Barley	Main						
SA	Murray Mallee	Canola	Low-Med Rainfall						
SA	Murray Mallee	Chickpea	Main						
SA	Murray Mallee	Faba Bean	Main						
SA	Murray Mallee	Field Pea	Main						
SA	Murray Mallee	Lentil	Main						
SA	Murray Mallee	Lupin	Main						
SA	Murray Mallee	Oat	Main						
SA	Murray Mallee	Wheat	Early Break						
SA	Murray Mallee	Wheat	Main						
SA	S/E	Wheat	long						
SA	South East	Barley	Long						
SA	South East	Canola	Med-High Rainfall						
SA	South East	Chickpea	Main						
SA	South East	Field Pea	Main						
SA	South East	Lentil	Main						
SA	South East	Lupin	Main						
SA	South East - Lower	Barley	Main						
SA	South East - Lower	Faba Bean	Main						
SA	South East - Lower	Oat	Main						
SA	South East - Lower	Wheat	Early						
SA	South East - Lower	Wheat	Main						
SA	South East - Upper	Barley	Main						
SA	South East - Upper	Faba Bean	Main						
SA	South East - Upper	Oat	Main						
SA	South East - Upper	Wheat	Main						
SA	Upper EP	Barley	Main						
SA	Upper EP	Canola	Low-Med Rainfall						

SA	Upper EP	Chickpea	Main						
SA	Upper EP	Faba Bean	Main						
SA	Upper EP	Field Pea	Main						
SA	Upper EP	Lentil	Main						
SA	Upper EP	Lupin	Main						
SA	Upper EP	Oat	Main						
SA	Upper EP	Wheat	Early Break						
SA	Upper EP	Wheat	Main						
SA	Yorke P	Barley	Main						
SA	Yorke P	Canola	Low-Med Rainfall						
SA	Yorke P	Canola	Med-High Rainfall						
SA	Yorke P	Chickpea	Main						
SA	Yorke P	Faba Bean	Main						
SA	Yorke P	Field Pea	Main						
SA	Yorke P	Lentil	Main						
SA	Yorke P	Lupin	Main						
SA	Yorke P	Oat	Main						
SA	Yorke P	Wheat	Durum						
SA	Yorke P	Wheat	Main						

VICTORIA

State	Region	Crop	Series	Apr	Apr	Apr	Apr	May	May	May	May	Jun	Jun	Jun	Jun
VIC	Mallee	Barley	Main												
VIC	Mallee	Canola	Low-Med Rainfall												
VIC	Mallee	Chickpea	Main												
VIC	Mallee	Field Pea	Main												
VIC	Mallee	Lentil	Main												
VIC	Mallee	Lupin	Main												
VIC	Mallee	Oat	Main												
VIC	Mallee	Wheat	Early Break												

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VIC	Mallee	Wheat	Main						
VIC	North Central	Barley	Main						
VIC	North Central	Canola	Low-Med Rainfall						
VIC	North Central	Canola	Med-High Rainfall						
VIC	North Central	Field Pea	Main						
VIC	North Central	Lentil	Main						
VIC	North Central	Oat	Main						
VIC	North Central	Wheat	Early Break						
VIC	North Central	Wheat	Main						
VIC	North East	Barley	Main						
VIC	North East	Canola	Med-High Rainfall						
VIC	North East (Irrigated)	Canola	Med-High Rainfall						
VIC	North East	Faba Bean	Main						
VIC	North East	Lupin	Main						
VIC	North East	Oat	Main						
VIC	North East	Wheat	Early						
VIC	North East	Wheat	Main						
VIC	South West	Barley	Long						
VIC	South West	Canola	Med-High Rainfall						
VIC	South West	Faba Bean	Main						
VIC	South West	Field Pea	Main						
VIC	South West	Lentil	Main						
VIC	South West	Lupin	Main						
VIC	South West	Oat	Main						
VIC	South West	Wheat	Early						
VIC	South West	Wheat	Long						
VIC	Wimmera	Barley	Main						
VIC	Wimmera	Canola	Low-Med Rainfall						
VIC	Wimmera	Canola	Med-High Rainfall						
VIC	Wimmera	Chickpea	Main						

VIC	Wimmera	Faba Bean	Main						
VIC	Wimmera	Field Pea	Main						
VIC	Wimmera	Lentil	Main						
VIC	Wimmera	Lupin	Main						
VIC	Wimmera	Oat	Main						
VIC	Wimmera	Wheat	Durum						
VIC	Wimmera	Wheat	Early Break						
VIC	Wimmera	Wheat	Main						

NEW SOUTH WALES

State	Region	Crop	Series	Apr	Apr	Apr	Apr	May	May	May	May	Jun	Jun	Jun	Jun
NSW	N/E	Barley	Main												
NSW	N/E	Canola	Low-Med Rainfall												
NSW	N/E	Canola	Med-High Rainfall												
NSW	N/E	Chickpea	Main												
NSW	N/E	Faba Bean	Main												
NSW	N/E	Field Pea	Main												
NSW	N/E	Lupin	Main												
NSW	N/E	Oat	Main												
NSW	N/E	Wheat	Durum												
NSW	N/E	Wheat	Early												
NSW	N/E	Wheat	Long												
NSW	N/E	Wheat	Main												
NSW	N/W	Barley	Main												
NSW	N/W	Canola	Low-Med Rainfall												
NSW	N/W	Canola	Med-High Rainfall												
NSW	N/W	Chickpea	Main												
NSW	N/W	Faba Bean	Main												
NSW	N/W	Field Pea	Main												
NSW	N/W	Lupin	Main												

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NSW	N/W	Oat	Main
NSW	N/W	Wheat	Durum
NSW	N/W	Wheat	Early I I I I I I I I I I I I I I I I I I I
NSW	N/W	Wheat	Main
NSW	S/E	Barley	Main
NSW	S/E	Canola	Low-Med Rainfall
NSW	S/E	Canola	Med-High Rainfall
NSW	S/E	Chickpea	Main
NSW	S/E	Faba Bean	Main
NSW	S/E	Field Pea	Main
NSW	S/E	Lentil	Main Main
NSW	S/E	Lupin	Main Main
NSW	S/E	Oat	Main Main
NSW	S/E	Wheat	Early Early
NSW	S/E	Wheat	Long
NSW	S/E	Wheat	Main
NSW	S/W	Barley	Main Main
NSW	S/W	Canola	Low-Med Rainfall
NSW	S/W	Canola	Med-High Rainfall
NSW	S/W (irrigated)	Canola	Med-High Rainfall
NSW	S/W	Chickpea	Main
NSW	S/W	Faba Bean	Main
NSW	S/W	Field Pea	Main
NSW	S/W	Lentil	Main
NSW	S/W	Lupin	Main
NSW	S/W	Oat	Main
NSW	S/W	Wheat	Durum
NSW	S/W	Wheat	Early Early
NSW	S/W	Wheat	Main

QUEENSLAND

State	Region	Crop	Series	Apr	Apr	Apr	Apr	May	May	May	May	Jun	Jun	Jun	Jun
QLD	CQ - Dawson	Barley	Main												
QLD	CQ - Dawson	Chickpea	Main												
QLD	CQ - Dawson	Wheat	Durum												
QLD	CQ - Dawson	Wheat	Early												
QLD	CQ - Dawson	Wheat	Main												
QLD	CQ - Highland	Barley	Main												
QLD	CQ - Highland	Chickpea	Main												
QLD	CQ - Highland	Wheat	Durum												
QLD	CQ - Highland	Wheat	Early												
QLD	CQ - Highland	Wheat	Main												
QLD	SEQ	Barley	Main												
QLD	SEQ	Chickpea	Main												
QLD	SEQ	Wheat	Durum												
QLD	SEQ	Wheat	Early												
QLD	SEQ	Wheat	Main												
QLD	SWQ	Barley	Main												
QLD	SWQ	Chickpea	Main												
QLD	SWQ	Wheat	Durum												
QLD	SWQ	Wheat	Early												
QLD	SWQ	Wheat	Main												

TASMANIA

State	Region	Crop	Series	Apr	Apr	Apr	Apr	May	May	May	May	Jun	Jun	Jun	Jun
TAS	Northern Midlands	Barley	Long												
TAS	Northern Midlands	Wheat	Long												

20 APPENDIX K – ACCEPTABLE PUBLIC PRESENTATION OF NVT RESULTS GUIDELINES

In order to ensure consistent and accurate reporting of NVT results, the following guidelines have been developed. GRDC requires these guidelines to be followed whenever NVT Results are published, presented or reported. GRDC's prior approval to publish, present or report NVT Results is not required, although GRDC reserves the right to change this position and amend these guidelines at any time. GRDC also reserves the right to take any necessary action in the event that NVT Results are used other than in accordance with these guidelines. For the purpose of this document:

"NVT Results" means any output or indicator of cultivar performance that is analysed, predicted or demonstrated from operations conducted as part of the NVT program. This includes but is not limited to all analysed NVT yield results, NVT grain quality results, and NVT disease ratings results.

"NVT data" means any form of information collected at or resulting from an NVT trial.

- (1) Reference to NVT as the source of data and/or results must be made in all media resulting from use of NVT resources.
 - (a) Use of the NVT logo is required as a condition of accessing NVT results. More information on use of the NVT logo can be found in APPENDIX O – NVT BRAND STYLE GUIDE of the NVT Protocols.
- (2) Results must not be edited, manipulated, or presented in a way that could be construed as misleading, biased or otherwise detract from the value and reliability of the results.
 - (a) Upon request, users must be able to demonstrate the reproduction of results presented in marketing or other material with the results presented on the NVT website.
- (3) To maintain transparency and integrity of reported NVT results it is important users can cross check any published results against the official results presented on the NVT website. As such:
 - (a) Any results reported must clearly identify what information is included (Trial locations, years, varieties included/removed, selection rationale, etc) so results are reproducible on the Long Term Yield Reporter (LTYR).
 - (b) Results of unreleased cultivars must not be published. Only results on commercially available cultivars marked as released on the NVT website can be published.
 - (c) Results relating to unreleased or quarantined trials must not be published. Only results on trials that have been released can be published.
 - (d) Results must not be published if the cultivar was not present in the reported dataset. That is, if the number of trials for the cultivar is zero in the reported dataset.
- (4) When presenting NVT results alongside alternatively sourced data (for example, results from other projects or trials outside of NVT):
 - (a) NVT results and alternatively sourced data should be clearly delineated.
 - (b) Recalculating and/or combining NVT results with alternative data to produce blended or mixed results should not occur.

- (5) Results from the NVT Long Term MET analysis provide the most accurate and reliable prediction of cultivar performance and therefore should be the only yield results used in any additional reporting.
 - (a) Participating Breeding companies have access to privledged NVT data such as plot level yield data (kg/plot data) and yearly MET Spreadsheets for data integrity and transparency reasons only, but it is not to be used for further analysis or reporting.
 - (b) Analysed single site data is available from the NVT website in the Trial Report PDF and the Statewide Tables. This information is only made available to provide growers with information in the interim between harvest of their local trials and publishing of the official MET results. It is not to be used for further analysis.
 - (i) Using social media to reference a Trial Report PDF or a Statewide Table is allowed, but any post must include a direct link to the Table or PDF to ensure the latest information is presented to the reader.
 - (ii) Use of screenshots of interim trial report PDF's should only occur in social media if it captures the entire page, including all red text disclaimers asTables and PDFs are constantly updated/changing in the interim before MET data is finalised and available.
- (6) Any reanalysis of NVT results should not occur.
 - (a) The original NVT data set has already undergone statistical analysis to produce the NVT results. Any additional analysis will not take into account the previous analysis and will therefore produce sub-optimal results.

21 APPENDIX L – NVT Engagement with Breeding Companies on NVT Social Media

21.1 NVT will engage with breeding companies on social media platforms if the following are met;

- (1) If post is referencing specific variety or technology, do not make reference to competitor cultivars, programs, or technology.
- (2) All claims made can be substantiated by publicly available NVT information, any unsubstantiated claims (eg breeder produced results etc) will not be engaged with.

22 APPENDIX M – NVT DISEASE RATINGS CROP BY DISEASE COMBINATIONS

The following table outlines the NVT disease ratings crop by disease combinations. The crop by disease combinations are subject to change.

Crop	Disease	Commercial Cultivar	Recently Commercialise d Cultivar	Existing Pre- commercial Cultivar	New Pre- commercial Cultivar	Selected Varieties only	Notes
	Historic Definitions	AUS *BAR/VAR/ PUL/OAT	AUS* First	NVT Retention	NVT First		
Barley	Black point		TRUE	TRUE			
Barley	BYDV	TRUE	TRUE	TRUE	TRUE		
Barley	CCN		TRUE	TRUE			
Barley	Crown Rot	TRUE	TRUE	TRUE			
Barlev	Net Blotch - Net Form	TRUE	TRUE	TRUE	TRUE		
Barley	Net Blotch - Spot Form	TRUE	TRUE	TRUE	TRUE		
Barley	P. quasitereoides		-			TRUE	WA 15 specific entry list
Barlev	Powdery Mildew	TRUE	TRUE	TRUE	TRUE		
Barley	P. Neglectus Resistance	TRUE	TRUE	TRUE			
Barley	P. Neglectus Tolerance	TRUE	TRUE	TRUE			
Barley	P. Thornei Resistance	TRUE	TRUE	TRUE			
Barley	P. Thornei Tolerance	TRUE	TRUE	TRUE			
Barley	Rust - Barley Grass Stripe	TRUE	TRUE	TRUE	TRUE		
Barley	Rust – Barley Stripe					TRUE	Mexico screening activity
Barley	Rust – Leaf	TRUE	TRUE	TRUE	TRUE		
Barley	Rust – Stem	TRUE	TRUE	TRUE	TRUE		
Barley	Scald	TRUE	TRUE	TRUE	TRUE		
Canola	Blackleg	TRUE	TRUE	TRUE	TRUE		
Chickpea	Ascochyta blight	TRUE	TRUE	TRUE	TRUE		
Chickpea	Phytopthera Root Rot					TRUE	NVT Nothern 15 entries
Chickpea	P. Neglectus Resistance	TRUE	TRUE	TRUE	TRUE		
Chickpea	P. Neglectus Tolerance	TRUE	TRUE	TRUE	TRUE		
Chickpea	P. thornei Resistance	TRUE	TRUE	TRUE	TRUE		
Chickpea	P. thornei Tolerance	TRUE	TRUE	TRUE	TRUE		
Faba Bean	Ascochyta blight	TRUE	TRUE	TRUE	TRUE		
Faba Bean	Chocolate spot	TRUE	TRUE	TRUE	TRUE		
Faba Bean	Leaf Rust	TRUE	TRUE	TRUE	TRUE		
Faba Bean	P. thornei	TRUE	TRUE	TRUE	TRUE		

Field Pea	Bacterial blight	TRUE	TRUE	TRUE	TRUE		
Field Pea	Downy Mildew	TRUE	TRUE	TRUE	TRUE		
Field Pea	Powdery Mildew	TRUE	TRUE	TRUE	TRUE		
Field Pea	P. neglectus	TRUE	TRUE	TRUE	TRUE		
Field Pea	P. thornei	TRUE	TRUE	TRUE	TRUE		
		INCL	INCL	INCL	INOL		
Lontil	Ascochyta blight	TRUE	TRUE	TRUE	TRUF		
Lentil	Botrytis Grey Mould	TRUE	TRUE	TRUE	TRUE		
Lentil	P. neglectus	TRUE	TRUE	TRUE	TRUE		
Lontil	P. thornei	TRUE	TRUE	TRUE	TRUE		
Lentin		INCL	INCL	INCL	INCL		
Lunin	Anthracnose	TRUE	TRUE	TRUE	TRUE		
Lupin	Cucumber Mosaic	INCL	INCL	INCL	INCL		
Lupin	Virus Phomopsis	TRUE	TRUE	TRUE	TRUE		
Lupin	Sclerotinia stem rot	TRUE	TRUE	TRUE	TRUE		
Lupin		TRUE	TRUE	TRUE	TRUE		
	Bacterial Blight						
Oat	BYDV	TRUE	TRUE	TRUE	TRUE		
Oat	CCN	TRUE	TRUE	TRUE	TRUE		
Oat	Leaf/Crown Rust	TRUE	TRUE	TRUE	TRUE		
Oat	P neglectus	TRUE	TRUE	TRUE	TRUE		
Oat	P thornei	TRUE	TRUE	TRUE	TRUE		
Oat	P. diomer	TRUE	TRUE	TRUE	TRUE		
Oat	Septeria Plateb	TRUE	TRUE	TRUE	TRUE		
Oat	Septoria Biotch	TRUE	TRUE	TRUE	TRUE		
Oat	Resistance	TRUE	TRUE	TRUE	TRUE		
Oat	Stem Nematode	TDUE	TDUE	TDUE			
Oat	Stem Rust	TDUE	TRUE	TRUE			
		TROL	IROL	INCL	TROL		
Wheat	Black Point		TDUE	TDUE			
Wheat			TRUE	TRUE			
Wheat	Crown Rot		TRUE	TRUE			
Wheat	Evo Spot		TRUE	TRUE			
wheat	P. Neglectus		TRUE	TROE			
Wheat	Resistance P. Neglectus		TRUE	TRUE			
Wheat	Tolerance		TRUE	TRUE			
Wheat	P. Quasitereoides					TRUE	WA 15 specific entry list
Wheat	P. Thornei Resistance		TRUE	TRUE			
Wheat	P. Thornei Tolerance		TRUE	TRUE			
Wheat	Powdery Mildew	TRUE	TRUE	TRUE	TRUE		
Wheat	Rust - Leaf Rust	TRUE	TRUE	TRUE	TRUE		
Wheat	Rust - Stem Rust	TRUE	TRUE	TRUE	TRUE		
Wheat	Rust - Stripe (Yellow)	TRUE	TRUE				
Wheat	Sont Nodorum Plotob	TROL	TDUE	TDUE	INUL		
wiiedt	зері. поцогині вюісп	L	TRUE	IRUE		1	1

Wheat	Sept. Tritici Blotch	TRUE	TRUE	TRUE	TRUE	
Wheat	Yellow Leaf Spot	TRUE	TRUE	TRUE	TRUE	

23 APPENDIX N – NOTICE OF COMMERCIALISATION

Please transfer the declaration below onto your company letterhead, complete the required information, and sign. Return the declaration via email by 1 February to the NVT team ahead of the nomination period for the coming season.

NOTICE OF COMMERCIALISATION	
Ι	_ (Name),
	_(Position Title),
authorised representative of	(Breeder),
declare to Grains Research & Development Agreement entered into between the Breede	Corporation (GRDC) for the purposes of the NVT Participation or and GRDC (Agreement),
that the cultivar	(Variety)
on and from	(date of first commercial release)
is eligible for inclusion in the NVT program as in accordance with the terms and conditions	s a Commercial Cultivar, and eligible for a Commercialisation Credit of the Agreement and the NVT Protocols.
The cultivar must be available to Australian g • the year the cultivar is first te	grain growers to purchase seed and grow commercially in: ested in NVT as a commercial cultivar funded by GRDC, and/or
the year the Commercialisati	ion Credit is utilized.
I attach to this notice the following document commercial cultivar name, marketing materia	ts evidencing the above (eg documents demonstrating use of a als, evidence of seed sales, evidence of EPR collection):
•	
•	
Signed for and on behalf of Broader	

Signature of representative

Full name of representative (print)

Date

24 APPENDIX O – FENCE SIGNS

TSP's will be responsible for supply and maintenance of NVT fence signs.

An example of the art work is shown below. For artwork file and colour references please refer to APPENDIX O – NVT BRAND STYLE GUIDEavailable at https://grdc.com.au/brand/#nvt



The sign should be printed on: Print: Full Colour - single sided Stock: 5mm White Corflute Finished size: 594 x 841mm (A1) Finishing: Trim to finished size. Supplied with 6 eyelets in each.

The blank Site Manager Field should be completed by including Site Manager Name & phone number details which can be:

- (1) Printed in a black arial font of 75 pt minimum font size, or
- (2) Handwritten using thick BLACK permanent marker with instant drying, waterproof ink that won't bleed or blur when damp

- (3) At their discretion, TSP's are able to add a NVT check-in QR code stickers to the sign between the NVT and GRDC logos.
- (4) No other design changes should be made to the fence sign without prior approval from GRDC.

25 APPENDIX P – NVT BRAND STYLE GUIDE

NVT encourages the use of the NVT logo wherever NVT data is published.

if you require digital files of the various NVT logos they can be found at https://grdc.com.au/brand#nvt. Some examples below:



National Variety Trials

Brand Style Guide

This style guide has been prepared in order to protect the consistency and integrity of the GRDC National Variety Trials (NVT) brand.

Grains Research and Development Corporation

Please refer to this style guide before applying an NVT logo to any printed material or electronic artwork. The logos must not be re-created. A full set of logo artwork files are available from the GRDC Communications team.

Logo Forms

Logo Forms There are two forms of NVT logos - the NVT Default Logo Primary) and the NVT Logomark. The primary logo should be used in all instances, except where NVT results are being displayed. The logomark should be used in all locations where NVT results are displayed. The logomark dadges the results as official data of the GRDC National Vanety Trails. For example, in a graph the logomark can be placed; bottom right corner in the caption/locitoite, or to the right of the graph title, or link top jet or bottom right corner of the graph background etc. Table 1. Logo Forms, adjacent displays the variations of these logos - colour, black, while. Colour is the preferred variation, then black, While is to be used when the logos appears on a dark background. Opacity can be applied, however the approved percentages must be followed to allow enough contrast. Refer to adjacent table for allowable opacity percentage.

To maintain good legibility, do not use the colour logos on dark background, and do not use the white logos on light backgrounds. The minimum size of each logo must be followed.

	Colour	Black	White
NVT DEFAULT LOGO (PRIMARY)			
Usage: in all instances (besides NVT data results), for both print and online.	NATIONAL VARIETY TRIALS	NATIONAL VARIETY TRIALS	NATIONAL VARIETY TRIALS
Minimum size: W 22mm H 12mm			
	Do not apply opacity.	Opacity is allowed. No loss than 30%.	Opacity is allowed. No less than 70%
NVT LOGOMARK			
Usage: in all instances where NVT data results are being displayed, for both print and online.	INVT	INVT	INVT
Minimum size: W 14mm H 4mm			
	Do not apply opacity.	Opacity is allowed. No less than 30%.	Opacity is allowed. No less than 70%

NVT Brand Style Guide

26 APPENDIX Q – NVT QR CODES

NVT encourages the use of the NVT QR codes wherever NVT data is published. if you require digital files of the various codes, they can be found at <u>https://grdc.com.au/brand/nvt-qr-codes</u>. Some examples below:

