

SEED INDUSTRY STANDARDS – May 2015

RIAWA Accredited seed and seed collectors must comply with these standards

ACTION	STANDARD
<p>1. SEED HARVESTING</p> <p>1) <i>Collectors</i></p> <p>2) <i>Collection teams & individual collectors</i></p> <p>3) <i>Seed collected prior to Accreditation</i></p> <p>4) <i>Accurate identification of species</i></p> <p>5) <i>Appropriate harvest techniques</i></p> <p>6) <i>Provenance</i></p> <p>7) <i>Seed health and genetics</i></p> <p>8) <i>Contamination in the field by weed species</i></p>	<ul style="list-style-type: none"> ➤ All collectors must be appropriately licensed according to the Wildlife Conservation Act 1950 of Western Australia. ➤ Presence of at least one accredited collector in any team, with a maximum of 4 casual collectors, for all seed collected <u>after 1/1/16. Non-accredited collectors must be accompanied by accredited collector.</u> ➤ Accredited collectors may accredit their seed collected prior to their accreditation as long as it conforms to these standards. ➤ The collector must make reasonable efforts to ensure accurate species identification. ➤ Take voucher specimen where appropriate. ➤ Confirm identification by botanist where applicable. ➤ Collect to license requirements. ➤ Collect in a sustainable fashion and ensure minimal impact on ecological resources. *Refer <i>Florabank guidelines and Australian Seeds.</i> ➤ Only collect seeds when they are mature (point of natural dispersal, or from fruits >1 year old) ➤ Maintain genetic integrity of seed lots through separation of provenance, accurate records and collection data.*Refer <i>Flora Bank Guidelines and Australian Seeds.</i> ➤ Where possible collect seed from a minimum of ten plants randomly located on site (as widely as possible) to provide a good genetic representation, from plants that are disease and pathogen free and not under stress. ➤ Where seed is collected from a smaller number of plants it must be mixed with other seed (prior to use in propagation) collected from enough plants to increase the genetic diversity. The detail and provenance of each seed batch in a mixed batch must be specified on the label. ➤ Use harvest techniques that avoid the collection of weed species. ➤ Target populations for collection that are known to have minimal weed infestation. ➤ Vacuum harvesting techniques are only to be used in weed free areas or on readily identifiable species which can easily be cleaned down to pure samples.

<p>9) <i>Appropriate post-harvest handling techniques</i></p>	<ul style="list-style-type: none"> ➤ Sun drying seeds is acceptable however seeds need to be covered or stored after such drying to avoid high humidity fluctuations at night. ➤ Ensure collected material is kept as dry and cool as possible between collection and return of material for drying and processing. ➤ Monitor material to avoid deterioration from excess moisture, humidity and insect predation. ➤ Use appropriate bags for seed storage in the field such as woven synthetic, calico, hessian, wool bales and paper. ➤ Do not allow seed to sweat which may create an environment for mould and fungal development. ➤ Remove seeds from fleshy fruits as soon as possible.
<p>2. SEED PROCESSING</p> <p>1) <i>Processing record to be retained for each batch and provided to seed buyers on request</i></p> <p>2) <i>Appropriate maturing and drying conditions</i></p> <p>3) <i>Contamination of seed lots</i></p> <p>4) <i>Physical quality of seed</i></p>	<p>Record must contain:</p> <ul style="list-style-type: none"> ➤ Method of processing. ➤ Any seed test results. ➤ Purity state – pure or mixed with chaff to commonly accepted industry standard. ➤ Name of collector. ➤ Record should identify whether seed is from wild or cultivated populations. <ul style="list-style-type: none"> ➤ Spread seeds in well aerated, cool and dry environment as soon as practically possible. ➤ Avoid intense heat unless appropriate to the species (eg plastic tunnels during summer for releasing seeds from woody fruits etc.).Ensure these are well aerated. ➤ Monitor material regularly to avoid deterioration, contamination and predation. <ul style="list-style-type: none"> ➤ Collecting equipment, bags and all processing equipment must be thoroughly cleaned after use. ➤ Ensure a clean processing environment to avoid contamination of seed lots. ➤ Ensure individual batches are effectively separated during the whole processing operation. <ul style="list-style-type: none"> ➤ Each batch of processed seed must be examined to ensure that it contains seed of merchantable quality. ➤ Seeds must be clean and free of most impurities (dependent on seed grade), contain no live insects and have minimal damage.

<h3>3. SEED STORAGE</h3> <p>1) <i>Storage conditions – temperature, humidity & water content etc.</i></p> <p>2) <i>Rules applying to all Seed grades</i></p>	<ul style="list-style-type: none"> ➤ Long Term Standard – Conservation Grade Seed Seed must be stored at a maximum temperature of -18c or as appropriate per species following drying to 3-7% water content (equivalent to drying at 15 – 20% humidity). ➤ Commercial Plus Standard – A Grade Seed Seed must be stored dried in an air conditioned/cool room with a maximum temperature of 25c and RH <60%. ➤ Minimum Standard – B & C Grade Seed Seed must be stored in dry facility out of direct sunlight at ambient temperature and humidity. ➤ Use appropriate measures to ensure seed batches are kept insect free. This may include the use of carbon dioxide, freezing and other low toxicity preparations. ➤ Seed should be stored under conditions to suit the expected length of time for which it will be held*. ➤ *Refer to <i>Florabank Guideline 3 and also Australian Seeds, Seed Storage and Testing P53-60.</i>
<h3>4. SEED MARKETING & SUPPLY</h3> <p>1) <i>Seed Grading</i></p>	<ul style="list-style-type: none"> ➤ All seed will be graded according to whether it is Conservation or Commercial Grade <p>Seed for Academic and Conservation purposes:</p> <ul style="list-style-type: none"> ➤ Conservation Grade ➤ Correct collection procedures followed. ➤ Seeds stored to <u>Long Term Standard</u> ➤ Standard labelling. ➤ Exact location of collection on label. ➤ Seed cleaned to match common industry purity standard. ➤ Cut test information provided (% good seed). ➤ Filled/viable seeds per gram data provided. ➤ Seed purity data provided (percentage of pure seed in mix). ➤ Germination test /x ray test results provided. ➤ Voucher specimen of species collected supplied. ➤ Identification by Botanist. ➤ *Refer to <i>Florabank Guidelines – Keeping Records On Native Seed. Australian Seeds.</i> <p>Commercial Grades – for industry purposes. Three grades are presented in order of quality:</p> <ul style="list-style-type: none"> ➤ A Grade – Commercial Plus ➤ Correct collection procedures followed. ➤ Seeds stored to – <u>Commercial Plus standard</u> ➤ Standard labelling. ➤ Filled, viable seeds per gram recorded.

<p>2) Seed labelling</p>	<ul style="list-style-type: none"> ➤ B Grade – Standard Commercial ➤ Correct collection procedures followed. ➤ Seeds stored to – <u>Minimum standard</u> ➤ Standard labelling. ➤ Confirmation that viability test performed ➤ C Grade – Seeding Grade ➤ Cleaned to seeding grade (more chaff etc). ➤ Correct collection procedures followed. ➤ Seeds stored to – <u>Minimum standard</u> ➤ Standard labelling. ➤ To avoid the possibility of illegible writing printed labels are preferred. ➤ Each batch of seed must display the RIAWA Accredited Seed sticker and the following information as a minimum: ➤ Unique collection batch number. ➤ Genus & species. ➤ Collection date. ➤ Quantity in grams. ➤ Location of collection (nearest town/block etc. within ten kilometres). ➤ Grade of seed.
<p>5. PAYMENT OF CONTRACTORS & STAFF</p>	<ul style="list-style-type: none"> ➤ Free or volunteer labour should not be utilised in the collection of seed for commercial sale, other than for approved training purposes. ➤ All collection staff will be paid, as a minimum, award wage as per state and federal legislation.
<p>6. SEED ORCHARDS</p>	<ul style="list-style-type: none"> ➤ Seed orchards are appropriate for bulking individual species of known provenance. ➤ Ensure genetic integrity is maintained in orchard situations. ➤ Seed from seed orchards should be labelled as such.. ➤ *Refer to Florabank Guideline 7.
<p>7. COLLECTOR TRAINING</p>	<ul style="list-style-type: none"> ➤ All non-accredited collectors should receive adequate instruction and training to conform to these guidelines prior to the commencement of collection operations.

***References:**

- *Wildlife Conservation Act (1950)*
- *Florabank Guidelines: <http://www.florabank.org.au/>*
- *Australian Seeds (a guide to their Collection, Identification and Biology)*
 - *Editors: Luke Sweedman and David Merritt*
- *Plant Germplasm Conservation In Australia*
 - *Editors: Offord & Meagher - AUSCAR*