

The Evolution of a Workable Scheme for End Point Royalties for Plant Varieties

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Introduction

Plants in Australia can be intellectual property protected by patents under the *Patents Act* 1990 (Cth) (*Patents Act*) and plant breeder's rights (PBR) according to the *International Convention for the Protection of New Varieties of Plants* (UPOV Convention) compliant with the *Plant Breeder's Rights Act* 1994 (Cth) (*PBR Act*).¹ In dealing with the patent or PBR, the rights holder can collect royalties – these are an amount associated with the patent or PBR – as consideration to use the right, for the right to use the right, for information and knowledge about the patent or PBR, and the supply of assistance to exploit the patent or PBR.²

The royalties on protected plant materials were traditionally determined as part of an agreement between the right holder (or the assignee or licensee) and the purchaser at the time of purchase. The End Point Royalty (EPR)³ is an alternative to this model applying not at the point of purchase but on the outcomes from exercising the patent or PBR – either on the sale of harvested material, or the sale of products made from the harvested material.⁴ The EPR is then calculated either as a periodic payment imposed on the grower directly by the patent or PBR holder (or their licensee or assignee) based on reported harvested materials, or an automatic deduction imposed on growers when they deliver their harvested materials to traders (and then paid by the trader to the patent or PBR holder).⁵ In each case, the EPR is calculated according to the amount of harvested materials rather than the materials purchased at the time of first sale.

In the 1990s, EPRs were considered to be desirable because they would “encourage more rapid adoption of a new variety”, “increase revenue to support plant breeding programmes”, and “encourage further private investment in crop improvement”.⁶ Most significantly:

EPRs have the benefits of reducing upfront seed costs for growers, overcoming loss of sales through farmer's privilege ... and sharing the risk of crop failure between growers and PBR owners.⁷

The purpose of this article is to review the development of EPRs as an alternative model for royalties to the traditional point of sale royalty models and the institutional architecture that has been implemented through law that enables EPRs as a means of collecting royalties. EPRs have now

matured in Australia and it is timely to reflect on the current arrangements and perhaps consider the longer-term consequences of these developments.

The article is structured as follows: The first part places the EPR arrangements within the statutory scheme for patents under the *Patents Act* and PBRs under the *PBR Act*. The following parts trace the evolution of the PBR scheme to accommodate EPRs and consider the approaches of the various *Primary Industries and Energy Research and Development Act* 1989 (Cth), and the Research and Development Corporations (RDCs) to EPRs. The final part sets out a discussion.

The article concludes that, despite a series of legislative developments to enable EPRs under the *PBR Act*, these were not necessary and that the impetus has come from certain of the RDCs, as a generalisation, educating growers about the benefits of EPRs, assigning unique grower identifiers, streamlining contractual arrangements, and providing science-based information to growers about the growing characteristics of the EPR-protected varieties. Finally, some of the future challenges are considered.

Current Patent Scheme

Under the *Patents Act*, a standard patent⁸ is personal property that can be assigned and licensed to others,⁹ that is the “exclusive right” to “exploit the invention and to authorise another person to exploit the invention”, where “exploit” includes:

- (a) *Where the invention is a product – make, hire, sell or otherwise dispose of the product, offer to make, sell, hire or otherwise dispose of it, use*

or import it, or keep it for the purpose of doing any of those things; or

- (b) *Where the invention is a method or process – use the method or process or do any act mentioned in paragraph (a) in respect of a product resulting from such use.*¹⁰

Any plant materials may be patented if the threshold criteria are satisfied,¹¹ and patents are routinely granted for whole plants and parts or components of plants. Significantly, for the purposes of this article, patents over whole plants and parts or components of plants allow the holder to exercise their “exclusive rights” until the patent exhausts. This does not happen as long as the patent holder (or the assignee or licensee) only gives away less than the whole interest in the patent and does not extend to the progeny (a remaking of the invention).¹² Significantly, the patent’s “exclusive rights” enable the patent holder (or the assignee or licensee) to impose conditions of the purchase of plant materials at the point of sale, including EPR arrangements.

Current PBR Scheme

Under the *PBR Act*, a PBR¹³ in a “plant variety”,¹⁴ is “personal property” that can be assigned and licensed to others,¹⁵ that is the “exclusive right”:

Subject to this Act, to do, or to license another person to do, the following acts in relation to propagating material of the variety:

- (a) *produce or reproduce the material;*
- (b) *condition the material for the purpose of propagation;*
- (c) *offer the material for sale;*
- (d) *sell the material;*
- (e) *import the material;*
- (f) *export the material;*
- (g) *stock the material for the purposes described in paragraph (a), (b), (c), (d), (e) or (f).*¹⁶

These “exclusive rights” in some circumstances extend to essentially derived varieties,¹⁷ certain dependent plant varieties,¹⁸ harvested material¹⁹ and products obtained from harvested materials.²⁰ These “exclusive rights” do not apply to acts done privately and for non-commercial purposes, for experimental purposes, or for the purpose of breeding other plant varieties,²¹ to the conditioning and using of farm saved seed,²² acts done by a person authorised by or under a law of the Commonwealth or of a State or Territory with adequate “equitable remuneration”,²³

where not all reasonable steps to ensure reasonable public access to that plant variety has been made,²⁴ and where the PBR has exhausted.²⁵ The relevant provisions, in respect of “harvested material”, and subject to a farmer seed saving provision,²⁶ are:

If:

- (a) *propagating material of a plant variety covered by PBR is produced or reproduced without the authorisation of the grantee; and*
- (b) *the grantee does not have a reasonable opportunity to exercise the grantee’s right in relation to the propagating material; and*
- (c) *material is harvested from the propagating material;*
*section 11 [the PBR’s “exclusive rights”] operates as if the harvested material were propagating material.*²⁷

and:

If:

- (a) *propagating material of a plant variety covered by PBR is produced or reproduced without authorisation of the grantee; and*
- (b) *the grantee does not have a reasonable opportunity to exercise the grantee’s rights in relation to the propagating material; and*
- (c) *material is harvested from plants grown from the propagating material but the grantee does not have, in the circumstances set out in section 14, a reasonable opportunity of exercising the grantee’s rights in the harvested material; and*
- (d) *products are made from the harvested material;*
*section 11 [the PBR’s “exclusive rights”] operates as if those products were propagating material.*²⁸

The *PBR Act* also provides an exemption for “farm saved seed” (really meaning all “propagating material” and not just seeds) if:

- (a) *a person engaged in farming activities legitimately obtains propagating material of a plant variety covered by PBR either by purchase or by previous operation of this section, for use in such activities; and*
- (b) *the plant variety is not included within a taxon declared [by the Plant Breeder’s Rights Regulations 1994 (Cth)]²⁹ to be a taxon to which this subsection does not apply; and*
- (c) *the person subsequently harvests further propagating material from plants grown from that first-mentioned propagating material;*

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the PBR is not infringed by:

- (d) the conditioning of so much of that further propagating material as is required for the person's use for reproductive purposes; or
- (e) *the reproduction of that further propagating material.*³⁰

The "farm saved seed" exemption is fairly narrow as the only "exclusive rights" exempted are the "reproduction" and "conditioning" for "reproduction". The other "exclusive rights" of producing, conditioning for producing, offering for sale, selling, importing, exporting and stock for these purposes remain. Further, the limiting of the conditioning to "for the person's use for reproductive purposes" means that "the reproduction of that further propagating material" is also confined to "for the person's use for reproductive purposes". In effect, the "farm saved seed" really only allows re-using the "propagating material" for personal use.³¹ This may be limited to only the first generation materials as subsequent farm saved seed generations may again be treated as "harvested materials" subject to the PBR's "exclusive rights".³² Any other dealings beyond personal use require the permission of the PBR holder.

Significantly, for our purposes, the PBR's "exclusive rights" enable the PBR holder (or the assignee or licensee) to impose conditions of the purchase of plant materials at the point of sale, including EPR arrangements.

Evolution of the PBR Scheme to Accommodate EPRs

The original legislative intervention in this area was the *Plant Varieties Act 1987* (Cth) that followed a detailed consideration of the competing issues relating to the desirability of a statutory scheme.³³ The main concerns driving legislation was access to desirable foreign plant materials and "an incentive for the private sector in Australia to become more active in plant breeding".³⁴ The resulting *Plant Variety Rights Act 1987* (Cth) was itself a long-fought compromise.³⁵

Following Australia joining the UPOV Convention in 1989, and then the revision of the UPOV Convention in 1991,³⁶ and various legislative amendments,³⁷ the *PBR Act* replaced the *Plant Varieties Act 1987* (Cth).³⁸ The *PBR Act* was drafted to conform to the revised 1991 UPOV Convention, and various other changes "to introduce other provisions that would further increase the efficiency of the plant variety rights

scheme".³⁹ Some of the key changes in the 1991 UPOV Convention that were incorporated in the *PBR Act* were:⁴⁰

- (a) Extending the scope of the PBR by specifying the "exclusive rights" exercisable by the PRB holder in addition to producing, reproducing, selling and licensing the "propagating material" to including condition the material, offering the material for sale, exporting and importing the material, and stocking the material for any of these purposes.⁴¹
- (b) Extending protections from just "propagating material" also to include "harvested material" and the "products made from harvested material".⁴²
- (c) Extending the PBR beyond the first sale where the "grantee does not have a reasonable opportunity to exercise the grantee's right in relation to" the "propagating material" and "harvested material".⁴³

The *PBR Act* was later amended by the *Plant Breeder's Rights Amendment Act 2002* (Cth) to avoid an interpretation of the PBR that allowed "some 90 per cent of PBR protected grain varieties in Australia pass through the commercial system without the PBR breeder having any opportunity to seek reward for their innovation".⁴⁴ The *PBR Act* had provided an exemption that acts done with the "propagating material" for use "as a food, food ingredient or fuel" or "for any other purpose that does not involve the production or reproduction of the propagating material" was not an infringement of the PBR.⁴⁵

At the same time, another amendment allowed a person authorised by a law (such as a statutory marketing authority) to infringe the PBR using "propagating material" and then pay "equitable remuneration".⁴⁶ At the time of the amendments, the Australian Government asserted that the "[a]gricultural industry is anticipating the introduction of the amendments positively as they will facilitate commercial arrangements based on plant breeder's rights, including through a system of end point royalties".⁴⁷ The *PBR Act* has had other amendments,⁴⁸ albeit not in material ways for the purposes of this article.⁴⁹

The basic scheme that enables EPR under the *PBR Act* was this provision for "exclusive rights" applying to "propagating material"⁵⁰ and certain "harvested material"⁵¹ where there has not been "a reasonable

opportunity" to collect a royalty on "propagating material".⁵² Importantly, the *Plant Variety Rights Act* 1987 (Cth) had only addressed "exclusive rights" for "plants of that variety", "reproductive material of plants of that variety", "plants of that variety for sale", "reproductive material of plants of that variety for sale", "asexual plants of that variety", "asexual reproductive material of plants of that variety" and some of the fruit, flowers, or any other product of asexual plants.⁵³ By expressly recognising both "propagating material" and "harvested material",⁵⁴ the *PBR Act* confirmed that dealings with harvested products of the PBR protected plants (such as seeds, flowers, fruits, cuttings, and so on) was an object that attracted the PBR's "exclusive rights".⁵⁵ Added to this there was express recognition that royalties could be imposed *after sale*⁵⁶ if there had not been "a reasonable opportunity" with the "propagating material".⁵⁷

With this authority of the PBR under the *PBR Act*, the rights holder can limit any dealings with the subject matter of the PBR (including the "harvested material") subject to agreement between the rights holder and the other party. Despite extending the PBR and the potential for EPRs to both "propagating material" and "harvested material", it is the basic "exclusive rights" over "propagating material" that founds agreements imposing EPRs.⁵⁸ The EPR is then set out as a term of the agreement on the purchase of plant materials at the point of sale:⁵⁹

- (a) As a term requiring the purchaser to later declare how much "harvested material" was produced (other than as farm saved seed) and paying the PBR holder (or their agent) directly. This approach relies on the purchaser of the PBR protected materials properly declaring the amount of "harvested material" produced. The disadvantage of this approach is that the EPRs are not collected on materials that are not declared.
- (b) As an authorised deduction on the payment made on "harvested material" delivered to a selected collection agency (such as a bulk grain handler). This approach relies on a centralised collection point properly identifying the PBR protected materials. The disadvantage of this approach is that the EPRs are not collected on materials that are not delivered to the centralised collection point.

The *Patents Act* was not beset with the perceived problems under the *PBR Act* as the patent does not necessarily exhaust on first sale and the progeny seeds are within the scope of the invention because they are a re-making of the invention. This is a distinction between *using* the patent-protected product and *making* the patent protected product. This distinction is necessary to avoid some important decisions that are likely to be significant in Australia as a consequence of the *Australia-United States Free Trade Agreement*.⁶⁰

In both the United States Supreme Court decisions of *Quanta Computer Inc v LG Electronics Inc* and *United States v Univis Lens Co*, the invention was embodied in the product and the licences were an attempt to limit the uses of the product.⁶¹ In contrast, the lower court decisions in *Monsanto Company v Bowman*, *Monsanto Company v Scruggs* and *Monsanto Company v McFarling* involved making the second-generation (or progeny) seeds.⁶² Arguably, making is fundamentally different from using in the context of patents and exhaustion, and the authority of *Quanta Computer Inc v LG Electronics Inc* and *United States v Univis Lens Co* arguably does not apply to making.⁶³ The United States Supreme Court is presently considering an appeal in the *Monsanto Company v Bowman* matter and seems likely to confirm the lower Court decision.

While both patents and PBRs enable EPRs to be imposed, the efficiency and effectiveness of imposing EPRs has been addressed through structural adjustments in the plant breeding industries. Without these structural adjustments steered by the RDCs, this would not have been possible. This is considered next.

Plant Breeding Industry Structure

The majority of Australian plant agriculture depends on self-pollinated field crops and annual pasture plants traditionally enabling farmers to maintain their own seed lines through on-farm planting and seed saving.⁶⁴ This has been the common practice because the growing and ripening conditions in Australia make on-farm planting a reliable source of saved seed for future growing.⁶⁵ This is in contrast with the European experience where ripening conditions make on-farm planting an unreliable source of seed for future growing and so encouraged farmers to buy in seeds that has sustained a significant commercial breeding culture for field, horticulture and ornamental plants.⁶⁶

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In the United States, a reliance on hybrid varieties of corn that imposed a natural (hybrid vigour) block on seed saving sustained a significant commercial breeding culture.⁶⁷ The result for Australian agriculture is that the ability of farmers to bulk up their own seeds for the self-pollinated field crops and annual pasture plants meant that only governmental breeding programs were sustainable.⁶⁸ As a measure of these practices some estimates are that up to 95 per cent of Australian wheat production relies on farm saved seeds.⁶⁹ As a consequence, Australian agricultural research relies significantly on taxpayer funding and has only slowly moved to a broader array of funding including a greater reliance on private funding.⁷⁰ This move has coincided with significant technology developments and the development of new institutions.⁷¹ It is these institutional changes establishing RDCs that have driven the adoption of EPRs by facilitating their implementation and adoption.

Through various evolutionary models, the current governmental arrangements under the *Primary Industries and Energy Research and Development Act 1989* (Cth) provide for RDCs.⁷² These RDCs essentially provide for a private sector-like corporation governed by industry and government experts that levy primary producers (and some processors), and then co-ordinate, among other things, a research investment strategy relying on the levy, some voluntary contributions and some co-investment from taxpayers.⁷³ Thus, for example, the *Sugar Research and Development Corporation Regulations 1990* (Cth) established the Sugar Research and Development Corporation⁷⁴ as a *Primary Industries and Energy Research and Development Act 1989* (Cth) RDC,⁷⁵ that benefits⁷⁶ from the levy imposed on “sugar cane produced in Australia ... and accepted at a sugar mill for processing⁷⁷ of 14 cents per tonne.⁷⁸ In recent times, the main change has been the transformation of some of the RDCs into industry-owned corporations operating under the *Corporations Act 2001* (Cth), enabling them to separate out their research activities from their marketing operations.⁷⁹ Thus, for example, the former Horticultural Research and Development Corporation was replaced⁸⁰ by Horticulture Australia Limited [ACN 095 566 108] as a company declared by the *Horticulture Marketing and Research and Development Services Act 2000* (Cth)⁸¹ that benefits⁸² from the levy imposed on “horticultural products ... produced in Australia

... that are ... sold by the producer or used by the producer in the production of other goods⁸³ of amounts per weight according to the horticultural products (almonds, apples, and so on).⁸⁴

In dealing with plants, the main RDCs address cotton (Cotton Research and Development Corporation (CRDC)),⁸⁵ grains (Grains Research and Development Corporation (GRDC)),⁸⁶ grapes (Grape and Wine Research and Development Corporation (GWRDC)),⁸⁷ sugar (Sugar Research and Development Corporation (SRDC)),⁸⁸ miscellaneous agricultural plants (Rural Industries Research and Development Corporation (RIRDC)),⁸⁹ forestry (Forest and Wood Products Australia (FWPA)),⁹⁰ and horticulture (Horticulture Australia Limited (HAL)).⁹¹ These organisations are considered next to illustrate the various approaches, limitations and institutional infrastructure necessary to impose EPRs and the leading roles driving the adoption of EPRs by the CRDC and GRDC, and the moves towards EPRs by the RIRDC and HAL.

Forest and Wood Products Australia (FWPA)

FWPA⁹² receives “forest industries products’ levy funding⁹³ from the Commonwealth for, in part, ‘marketing, promotion, research and development activities, or other activities, for the benefit of the Australian forestry industry⁹⁴ according to a ‘Funding Contract’⁹⁵ FWPA also receives matching funding from the Commonwealth for “research and development activities for the benefit of the Australian forestry industry and the Australian community generally”.⁹⁶

FWPA is a not-for-profit unlisted public company limited by guarantee under the *Corporations Act 2001* (Cth) formed in 2007 as an industry owned replacement for the former Forest and Wood Products Research and Development Corporation.⁹⁷ The change was:

... motivated by industry’s desire to intensify the promotion of forest and wood products in an increasingly competitive marketplace, and to more effectively market its environmental credentials.⁹⁸

The “Funding Contract” provides that FWPA can only spend the levy and matching funds for “approved activities” that are “consistent with” a “Strategic Plan”, the “Annual Operating Plan”, the “Guidelines”,⁹⁹ and “in a manner that is otherwise efficient, effective and ethical”.¹⁰⁰ The systematic breeding of plants for forest and wood products is

clearly within the remit of the company's funding¹⁰¹ and there is an active program of breeding.¹⁰²

The FWPA "Strategic Plan" and "Annual Operating Plan" require, among other things, an articulated "Research and Development Program",¹⁰³ and the firm must maintain an "Intellectual Property Management Plan".¹⁰⁴ The current "Strategic Plan" and "Annual Operating Plan" identify plant breeding as part of the company's priorities, including its investment priorities: "[g]enetic improvement and delivery for increased wood yield and quality and for managing risks".¹⁰⁵

The "Annual Operating Plan" also provides:

*Company funding policy is that all intellectual property created with FWPA funding is owned by the research provider, with FWPA maintaining an equity position in future IP commercialisation income. One of the conditions of FWPA funding for R&D projects is that levy payers have a beneficial right of access to final commercialised IP, through either reduced or waived royalty structures or other such arrangements that reflect the value of the levy funds provided to FWPA by the industry.*¹⁰⁶

FWPA is also required to prepare an "Annual Report" that addresses, among other matters, "intellectual property creation and protection, including management of intellectual property arising from research and development activities or acquired with funds".¹⁰⁷ A review of recent annual reports shows that EPRs are not a feature of FWPA's activities.¹⁰⁸ This is almost certainly because the harvested materials of forest industries products, such as trees, take a very long time to grow and collecting the EPR will be too far into the future.¹⁰⁹ In most instances, this is likely to be after the 20-25 year PBR term¹¹⁰ expires. As a consequence, EPRs are not a realistic model for the forest industries products.

Grape and Wine Research and Development Corporation (GWRDC)

The GWRDC¹¹¹ receives levy funding from the Commonwealth¹¹² for "the industry in Australia concerned with the production of grapes for processing, other than processing by drying" (grape industry) and "the industry in Australia concerned with the storage, distribution, marketing and sale of grape product or with the making of wine" (wine industry).¹¹³ The GWRDC also receives matching funding from

the Commonwealth for some of the research and development activities.¹¹⁴ The functions of the GWRDC include "to investigate and evaluate the requirements for research and development", "to co-ordinate or fund the carrying out of R&D activities that are consistent with the annual operational plan prepared by the Corporation and in force at the time" and "to facilitate the dissemination, adoption and commercialisation of the results of research and development".¹¹⁵ The GWRDC is a Commonwealth authority under the *Commonwealth Authorities and Companies Act 1997* (Cth) with various obligations to the Minister for Agriculture, Fisheries and Forestry and the Commonwealth Parliament.¹¹⁶

The GWRDC's *Strategic Research, Development and Extension Plan 2012-17* and our *Annual Operating Plan 2012-13* both articulate a research, development and extension (RD&E) "that supports a competitive Australian wine sector".¹¹⁷ None of these documents specifically addresses intellectual property, and perhaps significantly, the *Annual Report 2011-2012* provides that "the GWRDC holds no patents or other registered intellectual property".¹¹⁸ While intellectual property is reported in commissioned research reports, this does not appear to be actively taken up by the GWRDC. Like forest industries products, such as trees addressed above, vines take a long time to grow and collecting the EPR is a long way into the future. In many instances, this is likely to be after the 20-25 year PBR term¹¹⁹ expires. In the case of rootstock used for grafting desirable vines, there are no harvested materials. As a consequence, EPRs are not a realistic model.

Sugar Research and Development Corporation (SRDC)

The SRDC¹²⁰ receives levy funding from the Commonwealth¹²¹ for "the industry in Australia concerned with the production and processing of sugar cane, and the distribution, storage, marketing and sale of raw sugar".¹²² The SRDC also receives matching funding from the Commonwealth for some of the research and development activities.¹²³ The functions of the SRDC include "to investigate and evaluate the requirements for research and development", "to co-ordinate or fund the carrying out of R&D activities that are consistent with the annual operational plan prepared by the Corporation and in force at the time" and "to facilitate the dissemination, adoption and commercialisation of the results of research and development".¹²⁴ The SRDC is a Commonwealth

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authority under the *Commonwealth Authorities and Companies Act 1997* (Cth) with various obligations to the Minister for Agriculture, Fisheries and Forestry and the Commonwealth Parliament.¹²⁵

As a part of the SRDC's operations there is an active breeding program.¹²⁶ There does not, however, appear to be any interest in EPRs. This may be, in part, because sugar cane is planted from pieces of mature sugarcane (setts) that are planted using special machines which cut the mature cane into setts that are then mechanically placed into the prepared soils. After harvesting, the sugar cane then grows from the stubble left behind (the Ratoon Crop) that can be harvested and regrown three to four times.

Rural Industries Research and Development Corporation (RIRDC)

The RIRDC¹²⁷ receives levy funding from the Commonwealth¹²⁸ for a wide range of industries including the plant related "growing and harvesting of plants, grains, seeds, fruit or vegetables", "production of ... plant fibres", "growing, harvesting and processing of trees", and "production of animal feed".¹²⁹ The RIRDC also receives matching funding from the Commonwealth for some of the research and development activities.¹³⁰ The functions of the RIRDC include "to investigate and evaluate the requirements for research and development", "to co-ordinate or fund the carrying out of R&D activities that are consistent with the annual operational plan prepared by the Corporation and in force at the time" and "to facilitate the dissemination, adoption and commercialisation of the results of research and development."¹³¹ The RIRDC is a Commonwealth authority under the *Commonwealth Authorities and Companies Act 1997* (Cth) with various obligations to the Minister for Agriculture, Fisheries and Forestry and the Commonwealth Parliament.¹³²

As a part of the RIRDC's operations there are active breeding programs,¹³³ albeit EPRs are only starting to be considered.¹³⁴ Within the diversity of the RIRDC's broad interests there is starting to be some interest in EPRs.¹³⁵

Horticulture Australia Limited (HAL)

HAL¹³⁶ receives "horticultural product" levy funding¹³⁷ from the Commonwealth for marketing and research and development¹³⁸ according to a "deed of agreement".¹³⁹ HAL also received matching funding from the Commonwealth for certain research and development activities.¹⁴⁰ HAL is a not-for-profit unlisted public company limited by guarantee under the *Corporations Act 2001* (Cth) formed in 2001 as an industry-owned replacement for the former Horticultural Research & Development Corporation and Australian Horticultural Corporation.¹⁴¹ The "deed of agreement" of 3 November 2010 provides that HAL may only apply the levy funding and matching Commonwealth funding according to a "Strategic Business Plan", an "Annual Operational Plan" and "Guidelines".¹⁴²

The systematic breeding of plants for horticulture products is clearly within the remit of the company's funding for "horticulture research and development projects" and the "carrying out, and coordination and funding for the carrying out, of horticulture [systematic experimentation or analysis] activities".¹⁴³ There is currently an active program of breeding.¹⁴⁴ The "deed of agreement" of 3 November 2010 also requires HAL to have an "Intellectual Property Management Plan".¹⁴⁵ The Plan has not yet been published by HAL and remains confidential.¹⁴⁶ Perhaps surprisingly, however, the "Strategic Business Plan", the "Annual Operational Plan" and the "Guidelines" do not address intellectual property.¹⁴⁷ Despite this, HAL has taken an important role in promoting EPRs and the broader education of growers about EPRs.¹⁴⁸

Cotton Research and Development Corporation (CRDC)

The CRDC¹⁴⁹ receives levy funding from the Commonwealth¹⁵⁰ for "the Australian industry concerned with the production, distribution, processing and sale of cotton".¹⁵¹ The CRDC also receives matching funding from the Commonwealth for some of the research and development activities.¹⁵² The functions of the CRDC include "to investigate and evaluate the requirements for research and development", "to co-ordinate or fund the carrying out of R&D activities that are consistent with the annual operational plan prepared by the Corporation and in force at the time" and "to facilitate the dissemination, adoption and commercialisation

of the results of research and development".¹⁵³ The CRDC is a Commonwealth authority under the *Commonwealth Authorities and Companies Act 1997* (Cth) with various obligations to the Minister for Agriculture, Fisheries and Forestry and the Commonwealth Parliament.¹⁵⁴

As a part of the CRDC's operations there is an actively supported breeding program, albeit only part funded and administered by the CRDC.¹⁵⁵ To address the market failure in the late 1980s for breeding in the cotton industry the CRDC established a research program specifically directed to breeding improved cotton plants. This proved successful and, with the release of new varieties (almost yearly),¹⁵⁶ and associated royalty sharing arrangements (addressed further below),¹⁵⁷ the CRDC then withdrew.¹⁵⁸ The CRDC's breeding endeavours were superseded in 2007 with the Cotton Breeders Australia joint venture between the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and Cotton Seed Distributors Ltd (a grower owned enterprise formed in the 1980s).¹⁵⁹

In effect, the market failure identified and addressed by the CRDC in the late 1980s had been resolved and the CRDC/CSIRO joint venture was the independent and active breeding program envisioned by the CRDC.¹⁶⁰ The CRDC has since shifted to funding new challenges posed by changing climate and the "multi-enterprise production systems" (growing cotton as well as other crops in different seasons) so that the "emphasis for future R&D investment [is] to creating greater value for cotton post-farm-gate".¹⁶¹ Despite this change in major emphasis, the CRDC still funds breeding programs to improve cotton plant varieties as a part of its strategic investments, and in particular, premium cotton varieties for the high value yarn market.¹⁶²

Of particular interest for our purposes are the EPR arrangements for the CRDC funded breeding programs for which royalties are payable until 2017,¹⁶³ and the varieties made available from the Cotton Breeders Australia joint venture.¹⁶⁴ These breeding programs essentially introduced patent protected genetic elements into cotton varieties bred to suit Australian agricultural landscapes.¹⁶⁵ This involved breeding agreement between the owners of the germplasm, the owners of the proprietary genetic elements and the funders of the research introducing the proprietary genetic elements into the desirable germplasm,¹⁶⁶ including

agreement as to the division of royalties.¹⁶⁷ Farmers then purchase the seed for cropping according to an agreement and the payment of fees that include an option for EPRs. Cotton varieties with the proprietary elements "Bollgard II stacked with Roundup Ready Flex" illustrate the role and place of EPRs.¹⁶⁸

Before taking possession of seeds incorporating the proprietary elements "Bollgard II stacked with Roundup Ready Flex", the farmer is required to "complete and sign" the "Technology User Agreement".¹⁶⁹ The farmer is assigned a unique number that is required for each purchase of seeds,¹⁷⁰ and undertakes not to re-sell or supply seeds unless the farmer "has a *bona fide* and reasonable belief that the purchaser intends to and will use it only as stock feed or for cotton seed oil production",¹⁷¹ to not save any seeds,¹⁷² and not to plant the seeds produced from the harvest.¹⁷³ By signing the agreement, the farmer also agrees to allow the owner of the proprietary elements access to the farm and any records for audits, surveys and inspections,¹⁷⁴ and to pay one of the following fees:

- (a) "*Cotton Choices – Price discount*" – A fixed price per hectare (\$370) on the amount declared at the time of purchase and paid by a fixed date (28 February 2013).¹⁷⁵
- (b) "*Cotton Choices – Late Crop Removal and Extended Terms*" – A fixed price per hectare (\$401) that is "is waived if [the] crop is removed due to hail, drought or other adverse conditions or events" and with a later fixed date for payment (31 July 2013).¹⁷⁶
- (c) "*Cotton Choices – End Point Royalties for cotton*" – A fixed price per bale of harvested and ginned cotton lint (\$50/227kg bale) paid monthly.¹⁷⁷

Where a farmer (or "Grower") elects the "Cotton Choices – End Point Royalties for Cotton" fee then the following term applies:

Upon harvesting the Grower shall deliver all seed cotton produced on the Farm Unit to a Monsanto designated ginning organisation. Monsanto shall inform the Grower of such designated ginning organisations from time to time. The Grower shall be responsible for making the necessary arrangements with the designated ginning organization for ginning the seed cotton. The Grower shall bear the costs of delivering the seed cotton to the designated

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*ginning organization and the costs of ginning the cotton.*¹⁷⁸

The farmer is also required to inform the “designated ginning organisation” of information to identify the farmer¹⁷⁹ that will be used to cross match the identifying information¹⁸⁰ and report on the farmer’s delivered harvest.¹⁸¹ The farmer is then required to pay the EPR according to the harvest delivered and measured as units of bales of ginned cotton lint (\$50/227kg bale).¹⁸² The agent of the owner of the proprietary elements invoices the farmer for the EPR.¹⁸³

Grains Research and Development Corporation (GRDC)

The GRDC¹⁸⁴ receives levy funding from the Commonwealth¹⁸⁵ for “the industry concerned with the production, processing, manufacture, distribution and sale of grains”.¹⁸⁶ The GRDC also receives matching funding from the Commonwealth for some of the research and development activities.¹⁸⁷ The functions of the GRDC include “to investigate and evaluate the requirements for research and development”, “to co-ordinate or fund the carrying out of R&D activities that are consistent with the annual operational plan prepared by the Corporation and in force at the time” and “to facilitate the dissemination, adoption and commercialisation of the results of research and development”.¹⁸⁸ The GRDC is a Commonwealth authority under the *Commonwealth Authorities and Companies Act 1997* (Cth) with various obligations to the Minister for Agriculture, Fisheries and Forestry and the Commonwealth Parliament.¹⁸⁹

As a part of the GRDC’s operations there is an actively supported breeding program, albeit the GRDC has not had the same involvement in recent times. In the early 2000s, the GRDC moved to encourage market-based breeding programs and established a series of companies dedicated to plant breeding: Australian Grain Technologies Pty Ltd established in 2002; HRZ Wheats Pty Ltd established in 2003; and InterGrain Pty Ltd established in 2007.¹⁹⁰ GRDC has also entered joint ventures (such as Arista Cereal Technologies Pty Ltd) and invested in other plant breeding enterprises (such as Canola Breeders Western Australia Pty Ltd).

As at 2012, GRDC retains significant shareholdings in Australian Grain Technologies Pty Ltd (39 per cent), HRZ Wheats Pty Ltd (18 per cent), Arista Cereal Technologies Pty Ltd (21 per cent),

InterGrain Pty Ltd (27 per cent), and Canola Breeders Western Australia Pty Ltd (39 per cent).¹⁹¹ GRDC also remains involved in pre-breeding activities¹⁹² and a range of other activities associated with breeding that “support effective competition by Australian grain growers in global grain markets, through enhanced profitability and sustainability”.¹⁹³ GRDC has also retained some breeding activity for minor crops where EPRs are not considered to be feasible.¹⁹⁴

Of particular interest for our purposes has been the GRDC’s role in advocating EPRs and implementing the institutional changes to enable EPRs through its strategy to “[c]oordinate a national grains R&D agenda and portfolio” by “[w]ork[ing] with partners to tackle industry-wide issues such as ... value chain issues, including end point royalties”.¹⁹⁵ Particularly important has been GRDC’s role in:

- (a) *Streamlining the contracts between PRB/patent holders and growers* – On the purchase of a variety covered by EPRs the grower enters into a contract with the PBR/patent holder that allows the PBR/patent to be exploited and establishes the obligation to pay the EPR. At this stage, there are different contracts for each of the participating PBR/patent holders that are made available through the website <http://varietycentral.com.au>. For example, Australian Grain Technologies Pty Ltd provides an *Industry Standard PBR License Agreement* that grants the licence, allows use, imposes obligations to keep records, make reports and pay EPRs, together with the EPR obligations including authorising the EPR to be collected.¹⁹⁶
- (b) *The adoption of EPR collection practices across the grains industry* – The adoption of a common *Grower EPR Harvest Declaration Form* that identifies the grower with a unique identity on the National Grower Registry.¹⁹⁷ The declaration form then collects data about the total grain harvested, amounts of grain used on-farm, amounts stored future sales and amounts saved.¹⁹⁸ The grower then uses the forms to calculate the EPR amounts payable with the amounts being either deducted from payments to the grower on delivery of the crop or invoiced to the grower by a royalty manager.¹⁹⁹ The major growers have also now agreed to use a single entity, SeedVise Pty Ltd, to negotiate and collect EPRs.²⁰⁰

(c) *The provision of variety performance information for growers to make informed choices about varieties* – A website providing “access to independent results on the performance of recently released grain and field crop varieties from trials conducted across Australia”.²⁰¹ This site provides the data that allows EPR varieties to be compared with non-EPR varieties to determine whether the additional EPR is worthwhile for the particular grower.

As a consequence of these arrangements, most new wheat varieties available in Australia are subject to EPRs and the GRDC continues to actively promote EPRs (in part through the EPR Steering Committee).²⁰²

Discussion

Plants pose a problem for commerce – in some circumstances, the plant is itself both the product (the harvested materials) and the means of producing the product (the propagating materials). This means that buying the plant also buys the potential to make the plant and continue making the plant, potentially dulling the incentive to make and sell better plants because the innovator cannot capture and appropriate the values of the improvements.²⁰³

For success in commerce, these different attributes of the plant need to be separated.²⁰⁴ For outcrossing plants (such as maize), there is a natural means of exclusion in that future generations of the plant tend to lose the desirable traits (hybrid vigour). For self-crossing and asexually propagated plants (such as wheat and sugar cane respectively), there is no natural means of exclusion and this has spawned the need for legal means of excludability in the form of intellectual property applying to the plants (the propagating materials) and their products (the harvested materials) – the legally enforceable “exclusive rights” in certain dealings with the plant and its products.

In Australia, the *PBR Act* has attracted the most attention for plant intellectual property, albeit the *Patents Act* remains important, and may be increasingly important as patents have broadly similar “exclusive rights” without the exemption for farm saved seeds found in the *PBR Act*²⁰⁵ and the limitation of the “exclusive rights” to “propagating material” (and some “harvested material”) rather than applying all parts and components of the plant variety.²⁰⁶

The analysis in this article shows that for both patent and PBR protected plants an EPR requires the “exclusive rights” coupled with a contract. The “exclusive rights” limit dealings with the plants and their products and the contracts then provide the machinery for the imposition and collection of the EPRs. The significance of the analysis in this article is to demonstrate that to make EPRs work requires both “exclusive rights” and the development of specific collaborative institutional arrangements through the RDCs. The analysis of the various RDCs shows that the leadership of the CRDC and the GRDC in the cotton and grains industry respectively has had a significant effect on the adoption of EPRs. These examples also demonstrate the coordinating role of these RDCs (and HAL) in promoting and educating about EPRs, and then developing the contracting and information resources to implement EPRs.

The CRDC provides a model for dealing with patents (and PBRs) and EPRs, and the GRDC provides a model for dealings with PBRs and EPRs. EPRs are, however, not suitable for all sectors, with the GWRDC and rootstocks and the FWPA and trees being good examples of, respectively, plant varieties that have no harvested materials on which to impose an EPR or taking too long to grow to effectively collect an EPR. Despite the apparent successes for EPRs there remain some hurdles to achieve more successful EPR arrangements for breeders.

Some of these are now addressed.

One of the challenges faced by EPRs in the grains industry was the deregulation of bulk wheat export marketing under the *Wheat Export Marketing Act 2008* (Cth) and the *Wheat Export Accreditation Scheme 2008* (Cth)²⁰⁷ and of non-bulk wheat export (in bags and containers) under the *Wheat Marketing Amendment Act 2007* (Cth). The effect of this deregulation was to remove the single-desk export and marketing and in its place accredit numerous exporters so that breeders moved from dealing with a single exporter to collect the EPRs to dealing with a multitude of exporters and a multitude of collection points.²⁰⁸ To a large extent, this has been resolved through developing collaborative institutional arrangements: a unique identity on the National Grower Registry; a common *Grower EPR Harvest Declaration Form* founding the billing/invoicing arrangements; streamlined contracts made available through the website <http://varietycentral>.

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[com.au](http://www.com.au); and independent variety performance information made available to growers.

The positive outcome has been to effectively demonstrate the basic requirements for a workable and effective EPR that might be broadly applied across the different plant breeding sectors. At a minimum, this requires a means of identifying growers using the protected plant varieties, a means of tracking the growing activities of growers using the protected plant varieties and acceptable contracts that bind growers within the EPR tracking and collecting scheme. The elegance of the wheat industry example is that the different and competing entities involved from growers to wheat handlers have been able to agree to sufficiently uniform arrangements for the EPR system to work in practice. This is undoubtedly a model for the expansion of EPRs into other agricultural sectors.

There remain, however, weaknesses in the existing EPR scheme whereby some EPRs are not being paid to PBR (and patent) holders:²⁰⁹

A number of factors may contribute to inaccurate or mis-declaration of grain variety at point of delivery. Factors include industry structure, end point use (animal or human food) and lack of incentive for growers to accurately declare variety identity. Mis-declaration may also be inadvertent due to the complexity of variety audit systems. Other specific factors include:

- Difficulties associated with tracking and establishing ownership of the seed.
- Grain from several varieties may be mixed on farms during harvest and storage activities.
- Grain is often intermingled with other grain soon after delivery at the accumulation point based on the variety declared and some physical and chemical characteristics of the grain.
- Many grain varieties are closely related, have many attributes in common and are particularly difficult to distinguish on appearance.
- Considerable paperwork is often required by growers and/or others making it too difficult or onerous to comply with multiple EPR systems.
- Errors in varietal declaration occur due to the exercise of farm saved seed provisions on a variety for several years.

- The current differences in the level of EPR among varieties would appear to encourage flagrant mis-declaration of variety identity.
- Some 660,000 deliveries of grain are made by farmers to grain accumulation entities around Australia each year.

Subsequently, enforcement measures against infringers may be very difficult because of the structure and practices of receival systems (and lack of a robust varietal identification).²¹⁰

In addressing these problems the Advisory Council on Intellectual Property (ACIP) considered that variety identification was critical for an effective EPR scheme and that under the *PBR Act* there was no positive obligation to knowingly declare a PBR protected variety as such.²¹¹ The ACIP considered that, if various consumer and fair trading laws were insufficient to make a knowing declaration that avoided paying an EPR illegal, then “the *PBR Act* should be amended to make such an act an infringement of PBR”.²¹² The Australian Government’s response was that the existing provisions of the *Competition and Consumer Act 2010* (Cth) involving misleading and deceptive conduct, false representations about the characteristics of good and false and misleading representations about goods were sufficient.²¹³ The same comments might equally apply to the *Patents Act* where protected varieties’ materials are improperly identified.

The ACIP also considered the circumstances in which the PBRs’ “exclusive rights” could not be efficiently enforced because of the costs of tracing large numbers of growers’ royalty obligations, and the significant amounts of “harvested material” that is sold directly to other than traders and bulk-handlers (such as millers, maltsters, ethanol producers, and other end users), or used as livestock feed on-farm and in feed-lots.²¹⁴ The ACIP also identified that, in many instances, those best placed to collect the EPR were not exercising a PBR and so could not be obliged to collect the EPRs for the breeders.²¹⁵ The ACIP considered extending the “exclusive rights” to include a “use right” and a “purchase right”, eventually recommending against a “use right”²¹⁶ and in favour of a “purchase right”.²¹⁷ The proposed “purchase right” would apply to declared taxa only and be an addition “exclusive right” to “do, or license another person to do, the following acts in relation to the propagating material of the variety ... purchase the material”.²¹⁸

The "purchase right" was conceived as necessary to improve the EPR system:

*A new "purchase" right would enable EPRs to be obtained from end users, traders and accumulators rather than growers. Because end users, traders and accumulators are less numerous and, as a general rule, more easily identified than growers, the existence of a purchase right would reduce transaction costs and probably increase compliance levels.*²¹⁹

Another measure that the ACIP recommended to enhance the EPR system was clarification that "harvested material" that is also "propagating material" be considered "propagating material" for the purposes of the "exclusive rights".²²⁰ There was some confusion about this matter following the *Cultivaust Pty Ltd v Grain Pool Pty Ltd* decisions.²²¹ The Australian Government's response to the ACIP's recommendations was to accept that the *PBR Act* be amended to clarify that "harvested material" that is also "propagating material" be considered "propagating material" for the purposes of the "exclusive rights",²²² and reject the "purchase right".²²³ The reason for rejecting the "purchase right" was because the problems could be resolved through contracts and that "[EPR] arrangements are evolving and are having greater acceptance across the grains industry" so that, at this stage, the change was not necessary.²²⁴ The amendment to the *PBR Act* clarifying the meaning of "harvested material" is still pending.

Another (minor) concern for EPRs are the so-called "closed loop contracts". Essentially, the *PBR Act* requires that the plant variety be available to the public at large. The *PBR Act* provides, in part:

- (1) Subject to [a certificate that the variety has no direct use as a consumer product], the grantee of PBR in a plant variety must take all reasonable steps to ensure reasonable public access to that plant variety.
- (2) Reasonable public access to a plant variety covered by PBR is taken to be satisfied if propagating material of reasonable quality is available to the public at reasonable prices, or as gifts to the public, in sufficient quantities to meet demand.²²⁵

The problem for EPRs is that the contracts imposing the EPR system operate by ensuring that all the PBR-ed materials are available subject to the restricted contract. This could run counter to the requirement that "propagating material of reasonable quality is available to the public

at reasonable prices, or as gifts to the public, in sufficient quantities to meet demand".²²⁶ The threshold of public access is uncertain, and arguably a contract imposing EPRs when making a variety publicly available is not reasonable, albeit this does not appear to be a concern or limit to the present EPR arrangements.²²⁷

Another concern of growers has always been whether the increased EPRs are actually getting back to the breeders.²²⁸ While there is not a lot of publicly available analysis, there has been some insight from recent analysis of barley varieties in Western Australia. The Western Australia Government through the Department of Agriculture and Food commits funds, together with the GRDC and Grain Pool Pty Ltd, to a *Barley Breeding Project* and a *Barley Improvement Project*. Together, the projects are directed to developing new barley varieties with have improved desirable traits and then assisted growers to integrate these improved varieties into their production systems. As a case study, this demonstrates the adoption of EPRs and the return of the amounts paid to further breeding programs.

Essentially, an analysis of the program over the period 2000/01 to 2006/07 showed the declining use of the non-EPR variety "Stirling" (65 per cent of total Western Australian production in 2000/01 to 21 per cent in 2006/07) and its replacement by the non-EPR variety "Gairdner" (released in 2000 and 23 per cent of production), and the EPR varieties "Baudin" (released in 2003 and 23 per cent of production), "Hamelin" (released in 2004 and 10 per cent of production) and "Vlamingh" (released in 2006).²²⁹ The price paid for delivered barley (harvested materials) depended on the variety and quality: "Stirling" attracted no premiums or EPRs; "Gairdner" attracted a variety premium of \$5.00 per tonne and a protein premium of \$2.50 per tonne and no EPRs; "Baudin" attracted a variety premium of \$7.00 per tonne and a protein premium of \$5.00 per tonne and EPRs of \$3.00 per tonne for malting barley and \$1.00 per tonne for feed barley; "Hamelin" attracted a variety premium of \$7.00 per tonne and a protein premium of \$5.00 per tonne and EPRs of \$3.00 per tonne for malting barley and \$1.00 per tonne for feed barley; and "Vlamingh" variety premiums had not been determined as at the time of the study it was yet to be planted and EPRs of \$3.50 per tonne for malting barley and \$1.50 per tonne for feed barley.²³⁰

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During the 2000/01 to 2006/07 period of the *Barley Breeding Project* the five-year average price was \$240.00 per tonne for malting barley and \$200 per tonne for feed barley.²³¹ The seven-year average for barley yield was 2.03 tonne per hectare.²³² As a rough and generalised estimate, this means that for the EPR varieties (“Hamelin” and “Baudin”) the EPR as a proportion of the harvest price was approximately 1.25 per cent for malting barley and 0.5 per cent for feed barley. Alternatively, the EPR was about \$6.18 per hectare for malting barley and \$2.03 per hectare for feed barley.²³³ The total EPRs collected for the period 2000/01 to 2006/07 was \$3.58 million of which the Department of Agriculture and Food received \$2.1 million and this was invested back into the ongoing *Barley Breeding Program*.²³⁴ The other EPR amounts collected also appear to have gone towards breeding programs.²³⁵

Whether this example reflects the broader practices is not certain. Perhaps some indication of the potential for amounts that might be extracted as profits (after some amounts are set aside for breeding programs) is the recent acquisitive interest in Australian seed companies. This reflects a broader consolidation among transnational corporations and the increasing networking (mostly through cross-licensing agreements) among these entities.²³⁶ As examples, Vilmorin & Cie (a wholly owned plant breeding subsidiary of Limagrains Holdings) has purchased a 25 per cent stake in Australian Grain Technologies Pty Ltd;²³⁷ Monsanto Company has purchased a 20 per cent stake in InterGrain Pty Ltd;²³⁸ and Dow AgroSciences Australia (a subsidiary of Dow Chemical Company) has purchased a 50 per cent stake in HRZ Wheats Pty Ltd.²³⁹ This does not confirm that these breeding entities spawned by the GRDC and its collaborators will not continue to invest their EPRs in breeding programs. It does, however, show that these larger life sciences companies see them as desirable entities and this might, at least in part, be because the locking-in of EPR contracts has the potential to extract higher returns from seed sales than were previously available without EPRs.²⁴⁰ The steady increase in EPRs suggests this is at least a possibility.²⁴¹

Perhaps the more important immediate analysis in evaluating the benefits or otherwise of EPRs is to return to the original policy objectives of adopting and regulating for PBRs in Australia. The key driver of PBR protections in Australia was the need to access foreign plants and the decision by owners of foreign grants of rights not to release

their plants in Australia without protections such as PBR.²⁴² While “[t]here are other mechanisms available for stimulating private plant breeding such as subsidies, bonuses, gratuities, trade marks, and so on, these would not give protection to owners of overseas varieties”.²⁴³ The other driving factor was to promote a private sector plant breeding capacity with the incentive of a PBR encouraging and enabling the private sector to invest and make viable plant breeding businesses.²⁴⁴ The EPR is one of the mechanisms that facilitates the appropriation of the benefits to the PBR and patent holders and is advocated, particularly in the grains and horticulture industries, because EPRs:

*help to reduce up-front costs to growers, encourage uptake of varieties, overcome loss of sales through farmers’ privilege and share the risk of crop failures between PBR owners and growers.*²⁴⁵

There is no doubt that in some sectors EPRs have been extraordinarily successful and eagerly adopted by those sectors. The GRDC and grains and the CRDC and cotton are, as the analyses in this article demonstrate, role models. Other sectors have been less successful to date, and for some sectors, such as FWPA for the forest industry products and GWRDC for grapes, EPRs may not be an appropriate mechanism.

For all sectors promoting and adopting EPRs, however, there remain some potential future problems for plant breeding as a consequence of drawing closer to the immediate interests of the private sector and away from the broader interests of government. This is a loss of the long-term cross cutting research that is required both to fund future research and deliver a sustainable industry. The particular problems are likely to be the concentration of private breeding because of economies of scale resulting in less plant variety diversity, and an increase in seed prices because of private sector market power through consolidation. There is also a requirement for the Australian Government to recognise that where EPR collection is difficult the consequence is likely to be an under-investment in germplasm protection and development, and plant breeding.²⁴⁶ This probably accounts for the ongoing interest of the RDCs, including the CRDC and the GRDC, in plant breeding programs, and in particular pre-breeding.

- 1 See *Plant Breeder's Rights Act 1994* (Cth), s.3 (Convention) and sch.1 (*International Convention for the Protection of New Varieties of Plants* of 2 December 1961, as revised at Geneva on 10 November 1972, 23 October 1978, and 19 March 1991). There are similar plant breeder's rights laws in other jurisdictions: see, for example, United States – *Plant Variety Protection Act 1970*, 7 U.S.C. §§ 2321-2582; United Kingdom – *Plant Variety and Seeds Act 1964* (UK); Canada – *Plant Breeder's Rights Act* (1991); and so on.
- 2 See, for example, *International Business Machines Corporation v Commissioner of Taxation* (2011) 91 IPR 120, [8]-[9], per Bennett J.
- 3 These EPRs in the context of plants are also called "Crop Improvement Royalties". This was the early terminology used to promote these royalties emphasising that the royalty was a return on breeding investment: see, for example, Howard Carr, "Crop Updates – The Crop Improvement Royalty". Available at: http://www.agric.wa.gov.au/PC_90771.html. Accessed: 7 March 2013.
- 4 Advisory Council on Intellectual Property, *A Review of Enforcement of Plant Breeder's Rights: Final Report* (IP Australia, 2010), p.125. For an overview of various charging mechanisms see Ross Kingwell, "Charging for the Use of Plant Varieties", (2001) 45 *Australian Journal of Agricultural and Resource Economics* 291.
- 5 See Grains Research and Development Corporation, *End Point Royalties: Facts Sheet*. Available at: <http://www.grdc.com.au/uploads/documents/End%20Point%20Royalties%20Fact%20Sheet.pdf>. Accessed: 7 March 2013.
- 6 Working Party for Review of Variety Testing and Release Procedures (Lazenby, A., Bartholomaeus, M., Boucher, B., Campbell, A., Cracknell, R., Eagles, H., Lee, J., Lukey, G. and Marshall, B), *Trials and Errors: A Review of Variety Testing and Release Procedures in the Australian Grains Industry* (GRDC, 1994), p.88. See also Ross Kingwell and Alistair Watson, "End-Point Royalties for Plant Breeding in Australia", (1998) 5 *Agenda* 323; L Cook, *End Point or Product Royalties: A Discussion Paper*, (New South Wales Agriculture, 1996).
- 7 Advisory Council on Intellectual Property (Final Report), above n4, p.6.
- 8 *Patents Act 1990* (Cth), s.3 and sch.1 (standard patent). Notably, "innovation patents" are not available for plants and the biological processes for the generation of plants: ss.3 and 18(3) and sch.1 (innovation patent).
- 9 *Patents Act 1990* (Cth), s.13(2).
- 10 *Patents Act 1990* (Cth), s.3 and sch.1 (exploit).
- 11 See *Patents Act 1990* (Cth), s.18.
- 12 See Charles Lawson, "Judicifying the Self-replicating to Commodify the Biological Nature Future: Patents, Contracts and Seeds", (2011) 20 *Griffith Law Review* 851.
- 13 *Plant Breeder's Rights Act 1994* (Cth), s.3 (PBR).
- 14 *Plant Breeder's Rights Act 1994* (Cth), s.3 (plant variety).
- 15 *Plant Breeder's Rights Act 1994* (Cth), s.20.
- 16 *Plant Breeder's Rights Act 1994* (Cth), s.11. A note was added to this section by amendment: see *Plant Breeder's Rights Amendment Act 2002* (Cth), s.3 and sch.1 (item 3).
- 17 *Plant Breeder's Rights Act 1994* (Cth), s.12.
- 18 *Plant Breeder's Rights Act 1994* (Cth), s.13.
- 19 *Plant Breeder's Rights Act 1994* (Cth), s.14.
- 20 *Plant Breeder's Rights Act 1994* (Cth), s.15.
- 21 *Plant Breeder's Rights Act 1994* (Cth), s.16.
- 22 *Plant Breeder's Rights Act 1994* (Cth), s.17.
- 23 *Plant Breeder's Rights Act 1994* (Cth), s.18.
- 24 *Plant Breeder's Rights Act 1994* (Cth), s.19.
- 25 *Plant Breeder's Rights Act 1994* (Cth), s.23.
- 26 *Plant Breeder's Rights Act 1994* (Cth), ss.14(2) and 17(1).
- 27 *Plant Breeder's Rights Act 1994* (Cth), s.14(1).
- 28 *Plant Breeder's Rights Act 1994* (Cth), s.15.
- 29 No taxon are presently declared.
- 30 *Plant Breeder's Rights Act 1994* (Cth), s.17.
- 31 *Cultivaust Pty Ltd v Grain Pool Pty Ltd* (2004) 62 IPR 11, 48, per Mansfield J.
- 32 *Cultivaust Pty Ltd v Grain Pool Pty Ltd* (2004) 62 IPR 11, 48-49, per Mansfield J. Some doubt has been expressed about this proposition: see *Cultivaust Pty Ltd v Grain Pool Pty Ltd* (2006) 67 IPR 162, 174, per Finn, Emmett and Bennett JJ. See also Advisory Council on Intellectual Property, above n4, pp.72-77.
- 33 See Linden Gillibank, "Plant Variety Rights in Australia" (1988) 47 *Meanjin* 454; Alec Lazenby, *Australia's Plant Breeding Needs* (AGPS, 1986); I.T. Edwards, "Plant Variety Rights and the Senate Committee Report" (1985) 16 *Search* 294; Senate Standing Committee on Natural Resources, *Plant Variety Rights* (AGPS, 1984); J.S. Gladstone, *Plant Breeding in Australia: Its Funding, Likely Effects of Plant Variety Rights Legislation, and Suggested Alternatives* (WA Department of Agriculture, 1983); A.P. Ockwell, *Plant Variety Rights – A Review of Issues*, Bureau of Agricultural Economics Occasional Paper No 65 (Australian Government Publishing Service, 1982); David Godden, "Plant Variety Rights in Australia: Some Economic Issues" (1982) 50 *Review of Marketing and Agricultural Economics* 51 and the references therein; H.R. Harding and D.J. Anderson, "Plant Variety Rights Legislation for Australia" (1982) 58 *Current Affairs Bulletin* 4; Department of Primary Industry, *Plant Variety Rights* (Department of Primary Industry, 1981); J.S. Gladstone, *Plant Breeding Needs and Plant Variety Rights* (WA Department of Agriculture, 1981).
- 34 Department of Primary Industry (Plant Variety Rights), *ibid.*, p.1.
- 35 See Commonwealth, *Parliamentary Debates*, House of Representatives, 8 October 1986, 1648-1653 (John Kerin, Minister for Primary Industries).
- 36 See *Plant Breeder's Rights Act 1994* (Cth), s.3 (Convention) and sch.1 (*International Convention for the Protection of New Varieties of Plants* of 2 December 1961, as revised at Geneva on 10 November 1972, 23 October 1978, and 19 March 1991).
- 37 See *Primary Industries and Energy Legislation Amendment Act 1990* (Cth), ss.26-33; *Primary Industries and Energy Legislation Amendment Act (No 2) 1989* (Cth), s.3 and sch.1; *Primary Industries and Energy Legislation Amendment Act 1988* (Cth), s.3 and sch.1.
- 38 *Plant Breeder's Rights Act 1994* (Cth), s.2 (commencement) and 78 (repeal).
- 39 Commonwealth, *Parliamentary Debates*, House of Representatives, 24 August 1994, 157 (Francis Walker, Minister for Administrative Service). See also Senate Standing Committee on Rural and Regional Affairs, *Report on the Consideration of a Bill Deferred to the Committee: Plant Breeder's Rights Bill 1994* (Parliament of the Commonwealth of Australia, 1994).
- 40 See also David Godden, "Growing Plants, Evolving Rights: Plant Variety Rights in Australia" (1988) 6 *Agribusiness Review*, Paper 3. Available at: <http://www.agrifood.info/review/1998/Godden.html>. Accessed: 7 March 2013.
- 41 Compare *Plant Variety Rights Act 1987* (Cth), s.12 with *Plant Breeder's Rights Act 1994* (Cth), s.11.
- 42 *International Convention for the Protection of New Varieties of Plants* (1991), Art 14(2); *Plant Breeder's Rights Act 1994* (Cth), ss.14 and 15.
- 43 *Plant Breeder's Rights Act 1994* (Cth), ss.14(1)(b) and 15(c).
- 44 Commonwealth, *Parliamentary Debates*, Senate, 13 March 2002, 603 (Kay Paterson, Minister for Health and Ageing); *Plant Breeder's Rights Amendment Act 2002* (Cth), s.3 and sch.1 (item 4).
- 45 *Plant Breeder's Rights Act 1994* (Cth), s.18(1) before the *Plant Breeder's Rights Amendment Act 2002* (Cth), s.3 and sch.1 (item 4).
- 46 *Plant Breeder's Rights Act 1994* (Cth), s.18(1) after the *Plant Breeder's Rights Amendment Act 2002* (Cth), s.3 and sch.1 (item 4).
- 47 Explanatory Memorandum, *Plant Breeder's Rights Amendment Bill 2002* (Cth), p.6.
- 48 See *Intellectual Property Laws Amendment (Raising the Bar) Act 2012* (Cth), s.3 and sch.6 (items 104-108); *Statute Law Revision Act 2011* (Cth), s.3 and sch.1 (item 92); *Statute Law Revision Act 2010* (Cth), s.3 and sch.1 (item 39) and 5 (item 137); *Crimes Legislation Amendment (Serious and Organised Crime) Act (No 2) 2010* (Cth), s.3 and sch.11 (item 15); *Personal Property Securities (Consequential Amendments) Act 2009* (Cth), s.3 and sch.2 (items 16 and 17); *Intellectual Property Laws Amendment Act 2006* (Cth), s.3 and schs.11 (items 1 and 2), 12 (items 5-7), 14 (items 1-3) and 15 (items 2 and 3); *Agriculture, Fisheries and Forestry Legislation Amendment (Application of Criminal Code) Act 2001* (Cth), s.3 and sch.1 (item 244); *Agriculture, Fisheries and Forestry Legislation Amendment Act (No 2) 1999* (Cth), s.3 and sch.1 (items 1-12); *Public Employment (Consequential and Transitional) Amendment Act 1999* (Cth), s.3 and sch.1 (item 733); *Agriculture, Fisheries and Forestry Legislation Amendment Act (No 1) 1999* (Cth), s.3 and sch.5 (items 1-6).
- 49 The *Plant Breeder's Rights Amendment Act 2002* (Cth), s.3 and sch.1 (item 4) was an amendment that confirmed that the trading of commodities that eventually became food were subject to PBR and royalties and not an exception: see Explanatory Memorandum, above

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- n47, pp.7-9. While this did not directly affect EPR it was considered at the time to "facilitate commercial arrangements based on the [Plant Breeder's Rights Act 1994 (Cth)], including through a system of end point royalties" (p.11).
- 50 See *Plant Breeder's Rights Act 1994* (Cth), s.11.
 - 51 See *Plant Breeder's Rights Act 1994* (Cth), ss.14(1) and 15.
 - 52 See *Plant Breeder's Rights Act 1994* (Cth), ss.14(1)(b) and 15(b).
 - 53 *Plant Variety Rights Act 1987* (Cth), ss.12(1) and (3).
 - 54 *Plant Breeder's Rights Act 1994* (Cth), ss.11, 14(1) and 15. This is consistent with the *International Convention for the Protection of New Varieties of Plants* (1991), Arts 14(2) and 15(2).
 - 55 *Primary Industries and Energy Research and Development Act 1989* (Cth), s. 149.
 - 56 See *Plant Breeder's Rights Act 1994* (Cth), s.23(1).
 - 57 See *Plant Breeder's Rights Act 1994* (Cth), ss.14(1)(b) and 15(b).
 - 58 See Advisory Council on Intellectual Property (Final Report), above n4, p.39.
 - 59 See Jay Sanderson, "Back to the Future: Possible Mechanisms for the Management of Plant Varieties in Australia" (2007) 30 *University of New South Wales Law Journal* 686, 701-702.
 - 60 *Australia-United States Free Trade Agreement* [2005] ATS 1, Art 17.9.14.
 - 61 *Quanta Computer Inc v LG Electronics Inc*, 553 US 617, 630 (2008); *United States v Univis Lens Co*, 316 US 241, 250-51 (1942).
 - 62 *Monsanto Company v Bowman*, 686 F.Supp.2d 834, 839 (2009); *Monsanto Company v Scruggs*, 459 F.3d 1328, 1335-1336 (2006); *Monsanto Company v McFarling*, 302 F.3d 1291, 1299 (2002).
 - 63 For a more detailed account, see Lawson, above n12.
 - 64 See J.S. Gladstone, *Plant Breeding Needs and Plant Variety Rights* (WA Department of Agriculture, 1981), p.5.
 - 65 See *ibid.*
 - 66 See *ibid.*, p.4.
 - 67 See *ibid.*, p.5.
 - 68 For an overview of governmental involvement and programs, see generally Industry Commission, *Research and Development*, Report No. 44 (AGPS, 1995).
 - 69 See GRAIN, *The End of Farm-saved Seed? Industry's Wish list for the Next Revision of UPOV*, GRAIN Briefing (GRAIN, 2007), p.5.
 - 70 See Productivity Commission, *Rural Research and Development Corporations*, Report No. 52 (Productivity Commission, 2011), pp.11-20 and 40. See also Bob Lindner, "Privatised Provision of Essential Plant Breeding Infrastructure" (2004) 48 *Australian Journal of Agricultural and Resource Economics*, 301.
 - 71 See R. Kingwell, "Institutional Change and Plant Variety Provision in Australia" (2005) 13 *Australasian Agribusiness Review*, Paper 5. Available at: <http://www.agrifood.info/review/2005/Kingwell.html>. Accessed: 7 March 2013.
 - 72 See generally Julian Alston, Michael Harris, John Mullen and Philip Pardey, "Agricultural R&D Policy in Australia" in Julian Alston, Philip Pardey and Vincent Smith, *Paying for Agricultural Productivity*, (Baltimore, MD: Johns Hopkins University Press, 1999), 118-173 and the references therein.
 - 73 See Productivity Commission, above n70, pp.23-34.
 - 74 *Sugar Research and Development Corporation Regulations 1990* (Cth), reg.4.
 - 75 *Primary Industries and Energy Research and Development Act 1989* (Cth), s.8.
 - 76 *Sugar Research and Development Corporation Regulations 1990* (Cth), reg.5.
 - 77 *Primary Industries (Excise) Levies Act 1999* (Cth), s.7 and sch.24 (cl 3).
 - 78 *Primary Industries (Excise) Levies Act 1999* (Cth), s.7 and sch.24 (cl 4); *Primary Industries (Excise) Levies Regulations 1999* (Cth), reg.5 and sch.24 (cl 2).
 - 79 See Productivity Commission, above n70, pp.25-26.
 - 80 See *Horticulture Marketing and Research and Development Services (Repeals and Consequential Provisions) Act 2000* (Cth), s.7 and sch.1 (repeal of the *Horticultural Research and Development Corporation Act 1987* (Cth)).
 - 81 *Horticulture Marketing and Research and Development Services Act 2000* (Cth), s.9; *Declaration of Industry Export Control Body* (Cth).
 - 82 *Horticulture Marketing and Research and Development Services Act 2000* (Cth), s.16(1).
 - 83 *Primary Industries (Excise) Levies Act 1999* (Cth), s.7 and sch.15 (cl 2(1)).
 - 84 *Primary Industries (Excise) Levies Act 1999* (Cth), s.7 and sch.15 (cl 4); *Primary Industries (Excise) Levies Regulations 1999* (Cth), reg.5 and sch.15 (cls 2-28).
 - 85 *Primary Industries and Energy Research and Development Act 1989* (Cth), s.8; *Cotton Research and Development Corporation Regulations 1990* (Cth), reg.4.
 - 86 *Primary Industries and Energy Research and Development Act 1989* (Cth) s.8; *Grains Research and Development Corporation Regulations 1990* (Cth), reg.4.
 - 87 *Primary Industries and Energy Research and Development Act 1989* (Cth), s.8; *Grape and Wine Research and Development Corporation Regulations 1991* (Cth), reg.4.
 - 88 *Primary Industries and Energy Research and Development Act 1989* (Cth), s.8; *Sugar Research and Development Corporation Regulations 1990* (Cth), reg.4.
 - 89 *Primary Industries and Energy Research and Development Act 1989* (Cth), s.9(1).
 - 90 Forest and Wood Products Australia Limited ACN 127 114 185; *Forestry Marketing and Research and Development Services Act 2007* (Cth), s.11(1). Formerly the Forest and Wood Products Research and Development Corporation: see *Forest and Wood Products Research and Development Corporation Regulations 1993* (Cth), reg.5; *Forest and Wood Products Research and Development Corporation (Repeal) Regulations 2007* (Cth), reg.3.
 - 91 Horticulture Australia Limited ACN 095 566 108; *Horticulture Marketing and Research and Development Services Act 2000* (Cth), ss.9(1) and (2). Formerly the Horticultural Research and Development Corporation: see *Horticultural Research and Development Corporation Act 1987* (Cth), s.4; *Horticulture Marketing and Research and Development Services (Repeals and Consequential Provisions) Act 2000* (Cth), s.7 and sch.1.
 - 92 Forest and Wood Products Australia Limited ACN 127 114 185; *Forestry Marketing and Research and Development Services Act 2007* (Cth), s.11(1).
 - 93 See *Forestry Marketing and Research and Development Services Act 2007* (Cth), ss.4, 8(1), 8(2) and 11(1); *Primary Industries (Excise) Levies Act 1999* (Cth), s.7 and sch.10 (cls 2 and 3); *Primary Industries (Excise) Levies Regulations 1999* (Cth), reg.5 and schs.10 (cl.1) and 27 (cl.8.3).
 - 94 *Forestry Marketing and Research and Development Services Act 2007* (Cth), s.8(2).
 - 95 *Forestry Marketing and Research and Development Services Act 2007* (Cth), s.8(1); Commonwealth of Australia ABN 24 113 085 695 and Forest and Wood Products Australia Limited ABN 75 127 114 185, *Agreement 2012-17* (Department of Agriculture, Fisheries and Forestry, 2012), cl.6.
 - 96 *Forestry Marketing and Research and Development Services Act 2007* (Cth), s.8(1); Commonwealth of Australia ABN 24 113 085 695 and Forest and Wood Products Australia Limited ABN 75 127 114 185, *Agreement 2012-17* (Department of Agriculture, Fisheries and Forestry, 2012), cl.6.
 - 97 Forest and Wood Products Australia, *Annual Report 2007-2008* (Forest and Wood Products Australia, 2008), p.2. See also *Forest and Wood Products Research and Development Corporation Regulations 1993* (Cth), reg.5; *Forest and Wood Products Research and Development Corporation (Repeal) Regulations 2007* (Cth), reg.3.
 - 98 Forest and Wood Products Australia (Annual Report), *ibid.*, p.4.
 - 99 These include Department of Agriculture, Fisheries and Forestry, *National and Rural Research and Development Priorities* (Department of Agriculture, Fisheries and Forestry, 2007) and the Department of Agriculture, Fisheries and Forestry, *Levy Principles and Guidelines* (Department of Agriculture, Fisheries and Forestry, 2009); Commonwealth of Australia ABN 24 113 085 695 and Forest and Wood Products Australia Limited ABN 75 127 114 185, *Agreement 2012-17* (Department of Agriculture, Fisheries and Forestry, 2012), cl.2 (Guidelines).
 - 100 *Agreement 2012-17*, *ibid.*, cl.6.1.
 - 101 See *ibid.*, cls.1 and 6.4 (Research and Development).
 - 102 A listed of funded projects is set out in the *Annual Reports*: see, for example, Forest and Wood Products Australia, *Annual Report 2011/12* (Forest and Wood Products Australia, 2012), p.94; Forest and Wood Products Australia, *Annual Report 2010/11* (Forest and Wood Products Australia, 2011), pp.65-66; and so on.

- 103 *Agreement 2012-17*, above n99, cls.8.2 and 8.4.
- 104 *ibid.*, cl.9.1.
- 105 Forest and Wood Products Australia (Annual Report 2011/12), above n102, p.38; Forest and Wood Products Australia, *Annual Operations Plan 2012/13* (Forest and Wood Products Australia, 2011), p.15.
- 106 Forest and Wood Products Australia (Annual Operations Plan 2012/13), *ibid.*, p.14.
- 107 *Agreement 2012-17*, above n99, cl.10.1 and sch.2.
- 108 See Forest and Wood Products Australia (Annual Report 2011/12), above n102; Forest and Wood Products Australia (Annual Report 2010/11), above n102; and so on.
- 109 See Advisory Council on Intellectual Property, *Review of Enforcement of Plant Breeder's Rights*, Issues Paper (IP Australia, 2007), 35.
- 110 *Plant Breeder's Rights Act 1994* (Cth), s.22(2).
- 111 *Primary Industries and Energy Research and Development Act 1989* (Cth), s.8; *Grape and Wine Research and Development Corporation Regulations 1991* (Cth), reg.4.
- 112 *Primary Industries and Energy Research and Development Act 1989* (Cth), ss.5 and 8; *Grape and Wine Research Development Corporation Regulations 1991* (Cth) regs.4 and 5(1); *Primary Industries (Excise) Levies Act 1999* (Cth), s.7 and schs.13 (cls.5 and 6) and 26 (cls.4 and 5); *Primary Industries (Excise) Levies Regulations 1999* (Cth), reg. 5 and schs.13 (cl.1) and 26 (cl.2).
- 113 *Primary Industries and Energy Research and Development Act 1989* (Cth), s. 8; *Grape and Wine Research and Development Corporation Regulations 1991* (Cth), reg.s3 and 4.
- 114 *Primary Industries and Energy Research and Development Act 1989* (Cth), s.30(1).
- 115 *Primary Industries and Energy Research and Development Act 1989* (Cth), s.11.
- 116 See, for example, Grape and Wine Research and Development Corporation, *Annual Report 2011-2012* (Grape and Wine Research and Development Corporation, 2012), 1. See also Charles Lawson, "Accountability for the Intellectual Property of Commonwealth Authorities and Companies Act 1997 (Cth) Commonwealth Authorities" (2006) 17 *Australian Intellectual Property Journal*, 149, 151-171.
- 117 Grape and Wine Research and Development Corporation, *Strategic Research, Development and Extension Plan 2012-17* (Grape and Wine Research and Development Corporation, 2012), 2; Grape and Wine Research and Development Corporation, *Annual Operating Plan 2012-13* (Grape and Wine Research and Development Corporation, 2012), 3.
- 118 Grape and Wine Research and Development Corporation, *Annual Report 2011-2012* (Grape and Wine Research and Development Corporation, 2012), 59.
- 119 *Plant Breeder's Rights Act 1994* (Cth), s.22(2).
- 120 *Primary Industries and Energy Research and Development Act 1989* (Cth), s.8; *Cotton Research and Development Corporation Regulations 1991* (Cth), reg.4.
- 121 *Primary Industries and Energy Research and Development Act 1989* (Cth), ss.5 and 8; *Sugar Research Development Corporation Regulations 1990* (Cth), reg.s 4 and 5(1); *Primary Industries (Excise) Levies Act 1999* (Cth), s.7 and sch.24 (cls.3 and 4); *Primary Industries (Excise) Levies Regulations 1999* (Cth), reg.s 5 and sch.24 (cl.2).
- 122 *Primary Industries and Energy Research and Development Act 1989* (Cth), s.8; *Cotton Research and Development Corporation Regulations 1991* (Cth), regs.3 and 4.
- 123 *Primary Industries and Energy Research and Development Act 1989* (Cth), s.30(1).
- 124 *Primary Industries and Energy Research and Development Act 1989* (Cth), s.11.
- 125 See, for example, Sugar Research and Development Corporation, *Annual Report 2011-2012* (Sugar Research and Development Corporation, 2012), ii. See also Lawson, above n116, 151-171.
- 126 See, for example, Sugar Research and Development Corporation, *Annual Operational Plan 2012-2013* (Sugar Research and Development Corporation, 2102),36-40.
- 127 *Primary Industries and Energy Research and Development Act 1989* (Cth), s.9.
- 128 *Primary Industries and Energy Research and Development Act 1989* (Cth), ss.5 and 9; *Rural Industries Research and Development Corporation Regulations 2000* (Cth), reg.s 26(1), 29(1) and 41(1); *Primary Industries (Excise) Levies Act 1999* (Cth), s.7 and schs.21 (cls.2 and 3), 23 (cls.2 and 3) and 27 (cl.2(1)); *Primary Industries (Excise) Levies Regulations 1999* (Cth), reg.5 and schs.23 (cl.2) and 27 (cl.9.2).
- 129 *Primary Industries and Energy Research and Development Act 1989* (Cth), s.9(2); *Rural Industries Research and Development Corporation Regulations 2000* (Cth), reg.6(1).
- 130 *Primary Industries and Energy Research and Development Act 1989* (Cth), s.30(1).
- 131 *Primary Industries and Energy Research and Development Act 1989* (Cth), s.11.
- 132 See, for example, Rural Industries Research and Development Corporation, *Annual Report 2011-2012* (Rural Industries Research and Development Corporation, 2012), 3. See also Lawson, above n116, 151-171.
- 133 These include wildflowers and native plants, tea trees, and rice: Rural Industries Research and Development Corporation, *Annual Report 2011-12* (Rural Industries Research and Development Corporation, 2012), 87, 92, 115 and 122, respectively. Other programs include quinoa and weeping grass: Rural Industries Research and Development Corporation, *New and Developing Plant Industries: RIRDC Completed Projects in 2011-12 and Research in Progress at June 2012* (Rural Industries Research and Development Corporation, 2013), 42 and 43, respectively.
- 134 Rural Industries Research and Development Corporation (Annual Report 2011-12), *ibid.*, 88.
- 135 See, for example, "Wild Flowers Australia, End Point Royalties – What are They and How do They Work?" (September 2012), *Newsletter*, 4. Available at: http://www.wildflowersaustralia.com.au/_files/f118094/WFA%20newsletter%20September%202012.pdf. Accessed: 7 March 2013.
- 136 Horticulture Australia Limited ACN 095 566 108; *Horticulture Marketing and Research and Development Services Act 2000* (Cth), s.9(1).
- 137 *Horticulture Marketing and Research and Development Services Act 2000* (Cth), ss.4, 9 and 16(1); *Primary Industries (Excise) Levies Act 1999* (Cth), s.7 and sch.15 (cls.3 and 4); *Primary Industries (Excise) Levies Regulations 1999* (Cth), reg.5 and sch.15 (cls.2.4-16.4, 17.5, 18.6, 19.4-21.4, 22.5, 23.5, 24.4, 25.5, 26.4, 27.4 and 28.4).
- 138 *Horticulture Marketing and Research and Development Services Act 2000* (Cth), s.16(1).
- 139 *Horticulture Marketing and Research and Development Services Act 2000* (Cth), s.12(1).
- 140 *Horticulture Marketing and Research and Development Services Act 2000* (Cth), ss.4 and 16(2).
- 141 Horticulture Australia Limited, *Annual Report 2001* (Horticulture Australia Limited, 2001), 3.
- 142 *Deed of Agreement between the Commonwealth of Australia and Horticulture Australia Limited ACN 095 566 108*, cl.7.2. Available at: http://cms2live.horticulture.com.au/admin/assets/library/hal_documents/pdfs/PDF_File_21.pdf. Accessed: 7 March 2013.
- 143 *ibid.*, cls.1 and 7.4.
- 144 A listed of current projects is set out in the *Annual Reports* identifying a variety of breeding programs: see Horticulture Australia Limited, *Annual Report 2012* (Horticulture Australia Limited, 2102) pp.33 (apples), 41 (peach), 46 (custard apple), 52 (macadamia), 59 (papaya), and so on.
- 145 *Deed of Agreement*, above n142, cl.12.1(c).
- 146 See *ibid.*, cl.12.3.
- 147 See Horticulture Australia Limited, *Strategic Plan 2012-2015* (Horticulture Australia Limited, 2012); Horticulture Australia Limited, *Annual Operating Plan 2012/13* (Horticulture Australia Limited, 2012).
- 148 See, for example, Horticulture Australia Limited, *Intellectual Property Education and Training for the Australian Horticulture Industries*, HG07051. Available at: http://www.horticulture.com.au/reports/search_final_reports_result.aspx?src=&orgid=0&projid=4820&strSearch=&strProjectNo=HG07051&strIndustry=0-All&strSortby=date&strDisplay=tiledesc&pageno=1. Accessed: 7 March 2013.
- 149 *Primary Industries and Energy Research and Development Act 1989* (Cth), s.8; *Cotton Research and Development Corporation Regulations 1991* (Cth), reg.4.
- 150 *Primary Industries and Energy Research and Development Act 1989* (Cth), ss.5 and 8; *Cotton Research and Development Corporation Regulations 1990* (Cth), regs.4 and 5(1); *Primary Industries (Excise)*

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- Levies Act 1999* (Cth), s.7 and sch. 5 (cls.2 and 3); *Primary Industries (Excise) Levies Regulations 1999* (Cth), reg.5 and sch.5 (cl.1).
- 151 *Primary Industries and Energy Research and Development Act 1989* (Cth) s.8; *Cotton Research and Development Corporation Regulations 1991* (Cth), regs.3 and 4.
- 152 *Primary Industries and Energy Research and Development Act 1989* (Cth), s.30(1).
- 153 *Primary Industries and Energy Research and Development Act 1989* (Cth), s.11.
- 154 See, for example, Cotton Research and Development Corporation, *Annual Report 2010-11* (Cotton Research and Development Corporation, 2011), iv. See also Lawson, above n116, 151-171.
- 155 See, for example, Cotton Research and Development Corporation, *Annual Operations Plan 2012/13* (Cotton Research and Development Corporation, 2012), 12-13.
- 156 See, for examples, National Land & Water Resources Audit, *Signposts for Australian Agriculture – The Australian Cotton Industry* (National Land & Water Resources Audit, 2008), 18; Cotton Research and Development Corporation, *Annual Report 2003-2004* (Cotton Research and Development Corporation, 2004), 77.
- 157 See Cotton Research and Development Corporation (Annual Report 2010-11), above n154, 90; Cotton Research and Development Corporation, *Annual Report 2009-10* (Cotton Research and Development Corporation, 2010), 123; and so on.
- 158 See Cotton Research and Development Corporation, *Annual Report 2006-07* (Cotton Research and Development Corporation, 2007), 65.
- 159 Cotton Research and Development Corporation, *R&D in Action 2003-2008* (Cotton Research and Development Corporation, 2008), 13. See also Commonwealth Scientific and Industrial Research Organisation, *Working Towards Building a Sustainable and Profitable Cotton Industry: The Cotton Breeding Australia Research Alliance* (Commonwealth Scientific and Industrial Research Organisation, 2012); Commonwealth Scientific and Industrial Research Organisation, *Joint Venture to Strengthen Cotton Breeding*, Media Release 07/191, 26 September 2007.
- 160 Cotton Research and Development Corporation (R&D in Action 2003-2008), *ibid.*, 1. See also Cotton Research and Development Corporation, *Strategic R&D Plan 2008-2013: The Quest for Sustainable Competitive Advantage* (Cotton Research and Development Corporation, 2008), 6.
- 161 Cotton Research and Development Corporation, *Strategic R&D Plan 2008-2013: The Quest for Sustainable Competitive Advantage* (Cotton Research and Development Corporation, 2008), 13. See also National Land & Water Resources Audit, *Signposts for Australian Agriculture – The Australian Cotton Industry* (National Land & Water Resources Audit, 2008), 10.
- 162 Cotton Research and Development Corporation (Annual Report 2010-11), above n154, 19 and 35; Cotton Research and Development Corporation, *Annual Operating Plan 2012-13* (Cotton Research and Development Corporation, 2012), 6.
- 163 Cotton Research and Development Corporation (Annual Report 2010-11), *ibid.*, 90; Cotton Research and Development Corporation, *Annual Report 2009-10* (Cotton Research and Development Corporation, 2010), 123; and so on.
- 164 See Cotton Seed Distributors Ltd, *46th Annual Report* (Cotton Seed Distributors Ltd, 2012), 6 and 27.
- 165 See, for example, Cotton Research and Development Corporation (Annual Report 2006-07), above n158, 49 and 65.
- 166 Essentially the CRDC funded breeding programs conducted by the CSIRO to conventionally improve the plant varieties and to introduce insert resistance and herbicide tolerance genes: see, for example, Cotton Research and Development Corporation, *Annual Report 1999-2000* (Cotton Research and Development Corporation, 2000), 30-31 and 35; Cotton Research and Development Corporation, *Annual Report 2000-2001* (Cotton Research and Development Corporation, 2001), 20-21; Cotton Research and Development Corporation, *Annual Report 2003-2004* (Cotton Research and Development Corporation, 2004), 75-78; and so on.
- 167 See, for example, Cotton Research and Development Corporation (Annual Report 1999-2000), *ibid.*, 17. See also Cotton Research and Development Corporation (Annual Report 2010-11), above n154, 9-10.
- 168 Other proprietary elements are also available including Bayer CropScience's "LibertyLink": see Cotton Seed Distributors Pty Ltd, *2012 Variety Guide* (Cotton Seed Distributors Pty Ltd, 2012), 7-10.
- 169 Monsanto Australia, *Cotton Essentials Guide 2012/2013* (Monsanto Australia, 2012), 11, (cl.3.1(a)).
- 170 *ibid.*, 11 (cl.3.1(c)).
- 171 *ibid.*, 12 (cl.3.1(e)).
- 172 *ibid.*, 12 (cl.3.1(f)).
- 173 *ibid.*, 12 (cls.3.1(g) and (h)).
- 174 *ibid.*, 12 (cls.3.1(k) and (l)).
- 175 *ibid.*, 13-14 (cl. 6(l)). See also Monsanto Australia, *Cotton Choices: You're in Control*, Product Guide 2012/13 (Monsanto Australia, 2012), 2.
- 176 Monsanto Australia (Cotton Essentials Guide 2012/2013), above n169, 14 (cl.6(2)). See also Monsanto Australia (Cotton Choices), *ibid.*, 3.
- 177 Monsanto Australia (Cotton Essentials Guide 2012/2013), *ibid.*, 14 (cl.6(3)). See also Monsanto Australia (Cotton Choices), *ibid.*, 3.
- 178 Monsanto Australia (Cotton Essentials Guide 2012/2013), *ibid.*, 14 (cl. 6.3(b)).
- 179 *ibid.*, 14 (cl. 6.3(c)).
- 180 *ibid.*, 14 (cl. 6.3(d)).
- 181 *ibid.*, 14 (cl. 6.3(e)).
- 182 *ibid.*, 14 and 16 (cls. 6.3(f) and 11.3(d)). See also Monsanto Australia (Cotton Choices), above n175, 3.
- 183 Monsanto Australia (Cotton Essentials Guide 2012/2013), *ibid.*, 17 (cl. 11.4(c)).
- 184 *Primary Industries and Energy Research and Development Act 1989* (Cth), s. 8.
- 185 *Primary Industries and Energy Research and Development Act 1989* (Cth), ss.5 and 8; *Grains Research and Development Corporation Regulations 1990* (Cth), regs.4 and 5(1); *Primary Industries (Excise) Levies Act 1999* (Cth), s.7 and schs.4 (cls.5 and 6), 12 (cls.5 and 6), 20 (cls.6 and 7) and 25 (cls.4 and 5); *Primary Industries (Excise) Levies Regulations 1999* (Cth), reg.5 and schs.4 (cl.4), 12 (cl.4), 20 (cl.3) and 25 (cl.4).
- 186 *Primary Industries and Energy Research and Development Act 1989* (Cth), s.8; *Grains Research and Development Corporation Regulations 1990* (Cth), regs.3 and 4.
- 187 *Primary Industries and Energy Research and Development Act 1989* (Cth), s.30(1).
- 188 *Primary Industries and Energy Research and Development Act 1989* (Cth), s.11.
- 189 See Grains Research and Development Corporation, *Annual Report 2010-11* (Grains Research and Development Corporation, 2011), v. See also Lawson, above n116, 151-171.
- 190 See Richard Gray and Katarzyna Bolek, *Grain Research Funding in Australia: Lessons from International Experience*, 11-14. Available at: <http://ageconsearch.umn.edu/bitstream/124176/2/2012AC%20IS%20Gray%20CP.pdf>. Accessed: 7 March 2013; Julian Alston, Richard Gray and Katarzyna Bolek, *Farmer-Funded R&D: Institutional Innovations for Enhancing Agricultural Research Investments*, 26-28. Available at: http://www.ag-innovation.usask.ca/caltrn_briefs/publications%20for%20download/CAIRN_2012_FarmerFundedRD_AlstonGrayBolek.pdf. Accessed: 7 March 2013.
- 191 Grains Research and Development Corporation, *Annual Report 2010-11* (Grains Research and Development Corporation, 2011), 84.
- 192 See, for example, Grains Research and Development Corporation, *Annual Report 2010-11* (Grains Research and Development Corporation, 2011) 16. "Pre-breeding" means "is R&D intended to contribute to genetic improvement for a trait or traits of economic value. It is often undertaken outside a commercial breeding program, but with the intent of providing improved germplasm, screening technology or breeding methods. Pre-breeding may include gene discovery, trait identification, developing markers, phenotypic screens and information generation": Primary Industries Standing Committee – R&D Sub-committee, *Grains Industry: National Research, Development and Extension Strategy* (Primary Industries Standing Committee, 2011), 3.
- 193 Grains Research and Development Corporation, *Annual Report 2010-11* (Grains Research and Development Corporation, 2011), 116.
- 194 See Grains Research and Development Corporation, *Annual Report 2010-11* (Grains Research and Development Corporation, 2011), 46-55. See also Grains Research and Development Corporation,

- End Point Royalties – Simplifying the System* (Grains Research and Development Corporation, 2011), 2.
- 195 See Grains Research and Development Corporation, *Annual Report 2010-11* (Grains Research and Development Corporation, 2011), 31. See also Grains Research and Development Corporation, *Strategic R&D Plan 2012-17* (Grains Research and Development Corporation, 2012), 38; Grains Research and Development Corporation, *Strategic R&D Plan 2007-12* (Grains Research and Development Corporation, 2007), 34.
- 196 Australian Grain Technologies Pty Ltd, *Industry Standard PBR Licence Agreement*. Available at: <http://varietycentral.com.au/wp-content/uploads/2011/03/2013-AGT-SeedLicense-Feb.pdf>. Accessed: 7 March 2013.
- 197 See Denis McGrath, "Australia's End Point Royalty Collection System Giving the Australian Grain Industry a Competitive Edge" (November 2010) *News In Grain*, 5.
- 198 EPR Steering Committee, *2011/2012 End Point Royalty Harvest Declaration Form*. Available at: <http://www.ngc.com.au/Site/wp-content/uploads/2012/04/A4-Final-layout-No-Merge-Fields.pdf>. Accessed: 7 March 2013. See also Denis McGrath, "Benefits to Growers from Plant Breeding Rely on Efficient EPR Collection" (2009) 83 *Ground Cover* 14, 14-15.
- 199 Grains Research and Development Corporation, *End Point Royalties – Simplifying the System* (Grains Research and Development Corporation, 2011), 2.
- 200 Gray and Bolek, above n190, 15; Alston, Gray and Bolek, above n190, 25.
- 201 National Variety Trials, *NVT Online*. Available at: <http://www.nvtonline.com.au>. Accessed: 7 March 2013.
- 202 See Grains Research and Development Corporation, *Annual Report 2011-12* (Grains Research and Development Corporation, 2012), 81-82; Grains Research and Development Corporation (*Annual Report 2010-11*), above n195, 44-47; and so on. See also *End Point Royalties: Facts Sheet*, above n5.
- 203 See, for example, Sanderson, above n59, 686-687. See also Brian Wright, Philip Pardey, Carol Nottenburg and Bonwoo Koo, "Agricultural Innovation: Investments and Incentives" in Robert Evenson and Prabhu Pingali, *Handbook of Agricultural Economics, Volume 3: Agricultural Development: Farmers, Farm Production and Farm Markets*, (Amsterdam: North-Holland, 2007), 2551-2564.
- 204 For an overview, see Andrew Alexandra and Adrian Walsh, "Exclusion, Commodification, and Plant Variety Rights Legislation" (1997) 14 *Agriculture and Human Values*, 313.
- 205 See *Plant Breeder's Rights Act 1994* (Cth), s.17.
- 206 See *Plant Breeder's Rights Act 1994* (Cth), ss. 11, 14 and 15.
- 207 See Productivity Commission, *Wheat Export Marketing Arrangements*, Report No 51 (Productivity Commission, 2010), iv.
- 208 *ibid.*, 362.
- 209 See also Advisory Council on Intellectual Property, *Review of Enforcement of Plant Breeder's Rights*, Options Paper (IP Australia, 2008), 72-75.
- 210 Advisory Council on Intellectual Property (Issues Paper), above n109, 26-27.
- 211 Advisory Council on Intellectual Property (Final Report), above n4, 125. Notably, declaring a non-PBR protected variety as a PBR protected variety is illegal: *Plant Breeder's Rights Act 1994* (Cth), s.75.
- 212 Advisory Council on Intellectual Property (Final Report), *ibid.*, 129.
- 213 Advisory Council on Intellectual Property, *Australian Government Response to the Advisory Council on Intellectual Property Report A Review of Enforcement of Plant Breeder's Rights*, 11. Available at: http://www.acip.gov.au/library/pbr_enforcement_response.pdf. Accessed: 7 March 2013.
- 214 Advisory Council on Intellectual Property (Final Report), above n4, 32-33.
- 215 *ibid.*, 32-35.
- 216 *ibid.*, 39-40.
- 217 *ibid.*, 40-42.
- 218 *ibid.*, 42.
- 219 *ibid.*, 40.
- 220 *ibid.*
- 221 See *Cultivaus Pty Ltd v Grain Pool Pty Ltd* (2006) 67 IPR 162, 174, per Finn, Emmett and Bennett JJ; *Cultivaus Pty Ltd v Grain Pool Pty Ltd* (2004) 62 IPR 11, 48-49, per Mansfield J. See also Sanderson, above n59, 692-696.
- 222 Advisory Council on Intellectual Property (Australian Government Response), above n210, 4-5.
- 223 *ibid.*, 4.
- 224 *ibid.*
- 225 *Plant Breeder's Rights Act 1994* (Cth), s.19.
- 226 *Plant Breeder's Rights Act 1994* (Cth), s.19(2).
- 227 This was a matter that was not raised in the review of enforcement of the *PBR Act*: see Advisory Council on Intellectual Property (Final Report), above n4, 125-129.
- 228 See, for example, Rebecca Thyer, "Breeders: EPR Key to Better Varieties" (2006) 63 *GroundCover*, 14. Available at: <http://groundcover.realviewdigital.com/?iid=70715&startpage=page0000001#folio=14>. Accessed: 7 March 2013.
- 229 Peter Coyle (ed.), *Returns to Research and Development Investment of the Department of Agriculture and Food Western Australia: Benefit Cost Analysis, 2006-2007* (Department of Agriculture and Food, 2007), 15-16.
- 230 *ibid.*, 19.
- 231 *ibid.*, 18.
- 232 *ibid.*, 20.
- 233 See also Blakely Paynter, *Net Returns from Growing Hamelin or Baudin Barley Versus Stirling or Gairdner in Western Australia*. Available at: [http://www.cdesign.com.au/proceedings_abst2005/posters9820\(pdf\)/poster_blakely6.pdf](http://www.cdesign.com.au/proceedings_abst2005/posters9820(pdf)/poster_blakely6.pdf). Accessed: 7 March 2013.
- 234 Coyle, above n226, 19.
- 235 See *ibid.*, 19-20.
- 236 See Philip Howard, "Visualizing Consolidation in the Global Seed Industry: 2006-2008" (2009) 1 *Sustainability*, 1266.
- 237 Vilmorin & Cie, *Vilmorin Renforce son Expertise en ble en Entrant au Capital D'Australian Grain Technologies (AGT)*. Available at: http://www.vilmorin.info/vilmorin/CMS/Files/Communiqués_presse/CP_AGT_15_juillet_08_fr.pdf. Accessed: 7 March 2013.
- 238 Monsanto Company, *InterGrain and Monsanto Announce New Wheat Breeding Collaboration*. Available at: <http://monsanto.mediaroom.com/index.php?s=27632&item=77218>. Accessed: 7 March 2013.
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- 240 See David Schimmelpennig, Carl Pray and Margaret Brennan, "The Impact of Seed Industry Concentration on Innovation: A Study of US Biotech Market Leaders" (2004) 30 *Agricultural Economics*, 157 (finding that "[i]ncreases in seed industry concentration have reduced biotech research intensity in the United States in the 1990s").
- 241 See, for example, Gray and Bolek, above n190, 16.
- 242 See Department of Primary Industry (Plant Variety Rights), above n33, 6 citing a 1976 report of the Australian Agricultural Council Working Party of "specific instances in which overseas owners of new plant varieties refused release to Australia because of their rights would not be protected". This was not universally accepted at the time: see Richard Hindmarsh, "Consolidating Control: Plant variety Rights, Genes and Seeds" (1999) 44 *Journal of Australian Political Economy*, 58, 59-62 and the references therein.
- 243 Department of Primary Industry (Plant Variety Rights), *ibid.*, 2.
- 244 See Sally Marsh, David Pannell, "Agricultural Extension Policy in Australia: The Good, The Bad and The Misguided" (2000) 44 *Australian Agricultural and Resource Economics*, 605; John Mullen, Don Vernon and Ken Fishpool, "Agricultural Extension Policy in Australia: Public Funding And Market Failure" (2000) 44 *Australian Agricultural and Resource Economics*, 629. Perhaps unsurprisingly the net economic effects and benefits of PBR have never been established: see Intellectual Property and Competition Review Committee, *Review of Intellectual Property Legislation under the Competition Principles Agreement* (IP Australia, 2000), 216 (Appendix 1 that did not include the *PBR Act*); David Godden, "Plant Variety Rights: Framework for Evaluating Recent Research and Continuing Issues" (1987) 3 *Journal of Rural Studies*, 255.
- 245 Advisory Council on Intellectual Property (Final Report), above n4, 125.
- 246 Kingwell and Watson, above n6, 332.