

PGG Wrightson Seeds - Submission to the Productivity Commission's Inquiry into Australia's Intellectual Property Arrangements – Response to Draft Report.

June 2016

1. Introduction

The Productivity Commission's draft report (entitled *Intellectual Property Arrangements 2016*) demonstrates a thorough understanding of the deficiencies in Australian Intellectual Property (IP) rights for plants that currently constrain or in some cases prevent investment and thus genetic gain. The recommendation to allow essentially derived variety (EDV) declarations to be made in respect to any variety is a good first step in remedying the current situation.

Despite concerns cited by the Productivity Commission regarding the complexities associated with allowing molecular data to contribute to EDV declarations, we clarify why we consider this technology can make a valuable contribution to enforcing plant IP right in Australia.

As requested by the Productivity Commission, we will provide our feedback on the practicalities of developing and implementing a market-impact test to aid in EDV determination. Our discussion will focus around the complexities of IP protection in outcrossing species and how a market function test could be implemented in them. We support the intent of a market impact test and suggest it could provide a valuable contribution to the rate of genetic gain in many different pasture species.

Lastly, we suggest a number of possible revisions to existing arrangements that may stimulate genetic gain in species where it has been all but absent due to firms being unable to make a suitable return on investment. We argue that in some forage species a 25 year period of protection is warranted due to very slow uptake by Australian farmers or to limited market size. We also suggest the introduction of a delayed breeders rights may be an option to stimulate genetic gain in particular species where it can be demonstrated the commercial incentive that has historically existed with current PBR has been insufficient to stimulate consequential iterative genetic gain.

2. Extension of PBR rights to non-PBR registered varieties

We most certainly back the productivity commissions draft recommendation to allow EDV declarations to be made in respect of any variety. Currently this loophole allows firms to operate quite successful businesses utilizing other's IP by simply avoiding the PBR system.

Should IP rights for plants be strengthened or existing rights assume greater focus on economic traits, closing this loophole will be an even higher priority as this will only increase the portion of pasture seed products that operate outside of the PBR system in order to avoid it.

We note however that so long as PBR rights are essentially unenforceable or not worth enforcing (due to associated costs or a continued fixation on economically irrelevant traits respectively) extension of PBRs rights to non-PBR registered cultivars may not have the desired impact on rates of genetic gain.

3. Reducing free riding to incentivise investment

1.1. PBR to consider economic traits

We discussed in our initial submission to the Productivity Commission (PGG Wrightson Seeds 2016), that as it is applied to forage species, the PBR system is primarily concerned with morphological traits, most of which are economically inconsequential for the financial wellbeing of farmers. The Productivity Commissions' draft report cites IP Australia (Waterhouse 2013) who identifies the following as "desirable features of Australia's PBR system":

- It establishes that tests of distinctiveness do depend on 'the principal features, performance or value of the variety'; and
- It defines what is not an EDV by requiring that important differences (more than cosmetic) must be demonstrated if the second variety is not to be declared as an EDV.

Whilst the PBR Act is certainly written in this manner to focus it on economically relevant traits, review of granted PBR clearly demonstrates that, perhaps with the exception of disease traits in some legumes, this is not how IP Australia are making their determinations in relation to important forage species. A sincere measure of the 'value of a variety' would be based on economic traits such as seasonal yield, persistence, forage quality and disease resistance. Instead, in the species most important to commerce (i.e. Perennial Ryegrass (*Lolium perenne*) and Lucerne (*Medicago sativa*)), as it becomes increasingly more difficult to statistically differentiate cultivars based on measured morphology, PBR applications simply expand to list tables of ever more economically irreverent cosmetic morphological traits.

While a system concerned with easy to measure traits is simple to administer and minimizes burden on the national authority in respect to EDV declarations, it does nothing to reduce free-riding and incentivise innovation, as is the purpose of PBR. We suggest IP Australia should consider how to realign the administration of PBR with their very important and intended purpose as a driver for innovation.

We suggest that the recent development of robust and independent plant variety evaluation schemes may in some species form the basis of the assessment of a plant varieties economic traits.

1.2. Market impact test

The Commission seeks feedback on the practicalities of developing and implementing a market-impact test to complement existing tests of essentially derived variety status.

Firstly, we commend any attempt to revise Australia's system of IP rights for plants in an attempt to reduce free-riding, especially in outcrossing forage species where it occurs to such an extent that it constrains or prevents innovation. Many grass species of significant importance to Australian agriculture (such as Phalaris (*Phalaris aquatica*) and Mediterranean Tall Fescue (*Festuca arundinacea*)) are characterized by very slow market adoption or limited market size, such that commercial cultivars do not see significant uptake or sales within their first decade of commercialization. These species are currently plagued by rapid free-riding (via cosmetic breeding) that as we discuss in our original submission to the productivity commission (PGG Wrightson Seed

2016) is facilitated and legitimised by the way Australia's PBR system is enforced. A system that considers both the commercial life of a cultivar and the commercial impact of EDVs bred from it has the ability to stimulate increased investment in plant breeding in Australia.

We consider the following important practicalities for the implementation of a market impact test in forage species.

EDV declarations should be able to be made in respect to any variety

It goes without saying that EDV declarations should be able to be made with respect to any cultivar for a market impact test to function.

PBR must consider important traits

To provide firms certainty to both invest in plant breeding and pursue suspected EDV cases, where possible, economically relevant traits should be pre-defined on a species by species basis. This should not be particularly difficult for major agricultural species. Further, to ensure IP right administrators do not become the 'gate keepers' for new innovations, the system should remain very open to any new economically important innovative traits of genuine value.

Formalised assessment process for species

If breeders are to have the certainty required to invest, formalized processes by which they can expect a market impact test to be assessed should be developed. Reducing the uncertainty regarding the defensibility of their IP rights will provide further incentive to invest. Development of these processes should involve contribution from those in private sector plant breeding as well as independent (i.e. no financial vested interest in plant breeding and its funding) specialists within the state sector, for instance, agricultural economist with a firm understanding of the:

- relevant industry;
- processes by which innovation is incentivised; and
- means by which firms will likely try and evade IP rights.

Determination of relatedness

More formalized process for the determination of relatedness should be developed on a species by species basis and be updated periodically to reflect technological progress. Certainty about a firm's ability to prove relatedness in the case of an EDV declaration will provide further incentive to invest. IP Australia should be required to ensure their processes reflect contemporary scientific knowledge.

1.3. Delayed breeders right and 25 year PBR

For many forage species in which innovation has stagnated, adoption is slow with consequential royalty income coming only towards the very end of the existing PBR period (20 year). These forage species due to their outcrossing nature are not characterised by any consequential lead time as firms may cheaply generate follow-on varieties within a very short period of time. There is very little if any private incentive to invest in species characterised by such a marketplace.

We suggest for pasture species characterised by a slow rate of adoption and a delayed royalty streams (in which there has been little if any consequential private investment) that a 25 year period of PBR protection similar to fruit trees and vines would be more appropriate.

Further, in many species the expectation of rapid follow-on breeding will prevent investment. Where it can be demonstrated that there is virtually no consequential investment in the improvement of a species or a new species is bought to market at considerable financial risk, we believe a delayed breeder's right (perhaps 15 years) should be considered to stimulate some level of investment. If this were implemented only in species where plant breeding efforts have been of no economic consequence (i.e. confined to trivial cosmetic alterations) or in species not yet commercialized for forage production then the risks of this right are minimal, as any gain it stimulates is better than that which would have occurred under existing rights.

4. Use of molecular techniques in PBRs enforcement

In relation to the use of molecular technologies in the enforcement of PBR, the Productivity Commission rightly identifies that “New technologies for characterising and measuring plant differences are unlikely to resolve the underlying problems with the rules used to determine essential derivation”. Cited literature (Lawson 2014, Sanderson 2011 and Janis & Smith 2007) considers the difficulties associated with relying on molecular techniques to determine the distinctiveness of plant varieties acknowledging the relationship between genotype and phenotype is less certain than an EDV system concerned with economically relevant traits would require.

We believe however that certain recent advances in molecular techniques do mean they could and should contribute very specific roles to the enforcements of PBR. We believe IP Australia should pro-actively consider the potential contribution these technologies could make on a case by case basis as they continue to develop.

1.4. Supporting PBR infringement cases

Recent advanced in genotyping technologies such as Genotype-by-sequencing (GBS) (Elshire *et al.* 2011) have greatly reduced costs associated with the use of molecular techniques for cultivar identification. Recent work by the Dairy Future CRC (Pembleton 2015) in Perennial Ryegrass demonstrate GBS to be an effective tool for both determining which variety a sample of seed is from and determine the relatedness of varieties of Perennial Ryegrass.

As a compliment to morphological measurements, the work of Pembleton (2015) could most certainly contribute to the efficient resolution of suspected PBR infringement cases involving over-the-fence or unauthorised sale of a ryegrass variety.

In subclover (a self-pollinating species) it is expected that recent work funded by the Rural Industries Research and Development Corporation (2012) will result in the development of a similarly useful tool for the discrimination of sub clover cultivars. Given PBR rights in this species

are generally not enforced (over-the-fence trading is rife and seed companies market non-PBR registered cultivars) the acceptance of proven molecular tools in PBR enforcement may go a long way to reducing free-riding in this species.

1.5. Contributing to EDV determination

In isolation the acceptance of molecular evidence will be of little benefit in EDV declaration under the PBR arrangements as it is administered by IP Australia, i.e. with a focus on morphological traits. However, should it be implemented with a focus on economic traits and evolve to include a market impact test, the techniques of Pembleton (2015) would prove very useful in informing knowledge of a cultivars relatedness, a key prerequisite to making an EDV declaration.

Given the recent progress in molecular techniques we suggest IP Australia should seek to regularly review how contemporary techniques can contribute to the objectives of PRB.

5. Complexities of outcrossing species

If two self-pollinating varieties are crossed, the performance of the offspring are unpredictable, offspring must be advanced through successive (approximately 7) generations before a marketable homozygous product can be developed and the 'winning' recombination of traits must be identified in one of usually many thousands of lines. This requires large investment over long periods of time by skilled individuals. Hence as the Productivity Commission identify in their draft report, there are only four firms who undertake this to any great extent in Australia and all of which have significant R&D expenditure.

In contrast when multiple individuals of two out-crossing species are crossed (most forage species are out-crossing) the performance of the resulting cross is almost entirely predictable, it will be the mean of the two parents. In addition, unskilled individuals need only to plant two cultivars next to each other (or mix the seed together) and harvest the resulting seed in order to generate of cross between varieties. This process is neither time consuming, skilled or expensive. Most often with little difficulty a distinct, uniform and stable line (for a combination of trivial cosmetic traits) can be generated in two growing seasons (one for crossing another for selection) by the cosmetic breeding (removal of 'off-types') so often described in PBR applications for outcrossing forage species. It is therefore rather predictable given the ease which a firm can free-ride that the Australian forage seed market is characterised by a few firms generating innovation and a large number of firms reliant on free-riding. The aforementioned differences between self-pollinating and out-crossing species in the ease with which firms are able to free-ride needs to be considered in the design of any IP system designed to stimulate investment and genetic gain.

A further complication of outcrossing species is the ease with which three or more market leading varieties can be crossed to together with almost entirely predictable results to generate a cultivar of equal merit. If legislation were to require that the infringing cultivar were for instance to be comprised predominantly of another cultivar for it to be declared an EDV, free-riding firms would simply ensure

all follow-on varieties were comprised of three or more cultivars. The expectation of this behavior should be considered in the improvement of existing rights or the implementation of a market impact test.

6. Recommendations and conclusion

Despite genuine differences in the economic worth of forage plant varieties, Australia's PBR system as it is currently implemented in forage plants, is simply a register of DUS cultivars between which there are cosmetic morphological differences, and as such plays very little if any role in incentivising the innovations upon which the productivity improvements of our farm's rely. If the state is to avoid having to directly fund improvement of forage cultivars, by some means, Australia's system of intellectual property rights for plants must refocus and find its intended purpose as a dearly needed and efficient driver of innovation.

PGG Wrightson Seeds consider the extension of PBR rights to all varieties regardless of PBR registration status to be essential to proper function of our plant IP right system. We are pleased the productivity commission has identified a need to protect economically important traits, not just cosmetic traits and consider the move to a market impact test a positive and logic progression for an IP rights system whose aim is the stimulation of investment and genetic gain. We have provided a number of suggestions as to what needs to be considered when developing an effective market impact test and believe it would make a positive contribution to the rate of genetic gain in many forage species relevant to Australian farmers.

Lastly, many forage species relevant to Australian farmers lack any consequential investment and therefor have no genetic gain. We suggest that these species present a perfect opportunity for Governments to 'experiment' with alternate IP arrangements and test their effects on innovation. As there is and will be no genetic gain in these species under existing IP arrangements, experimentation with strengthened IP rights in these species has no downside risk.

7. References

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