Writing your introduction & conclusion chapters - Handout

All texts below are real excerpts from successful theses.

Text A **Excerpt from the table of contents (Socially assistive robotics)**

Text B **Excerpt from the table of contents (Education)**

Text C **Excerpt from the table of contents (Nursing informatics)**

Text D **Excerpt from the table of contents (Psychology)**

Text E **Excerpt from the table of contents (Public health)**

Text F **Excerpt from table of contents (Oncology)**

Text G **Excerpt from table of contents (Education)**

Text H **Excerpt from table of contents (Socially assistive robotics)**

Text J **Excerpt from table of contents (Oncology)**

Text K **Excerpt from table of contents (Public health)**

Text L **Excerpt from table of contents (Nursing informatics)**

Text M **Excerpt from thesis (Agriculture)**

7.1 Conclusion

The studies in this thesis have demonstrated that *E. scaber* displays partial summer dormancy, which may offer some advantage in survival over non-dormant grass species in summer-dry environments. This was achieved through a treatment regime designed to isolate avoidance strategies from summer dormancy expression. This new insight in the expression of partial summer dormancy in *E. scaber* is in opposition to previously reported strong summer dormancy (Mitchel *et al.* 2001; Johnston *et al.* 2001). This may have been due to a misunderstanding of the definition of summer dormancy by these authors. The development of axillary buds for new tiller development has been observed, being similar to that seen in other grass geophytes such as phalaris. The study of bud dynamics in *E. scaber* is an area which requires further investigation.

There are three obstacles to the use of *E. scaber* in perennial cereal development. Firstly there is considerable work required to select more persistent accessions to provide donor material. Greater longevity was observed in a small percentage of plants within populations, indicating a possibility to develop accessions with greater perenniality. Secondly, there is difficulty in obtaining hybrid plants with this species and wheat, as post-zygotic barriers develop early in the wheat x *E. scaber* cross. Thirdly, there is likely to be difficulty in producing a consistent breeding line via partial aphiploid development from hybridising wheat with hexaploid *E. scaber.* A fertile wheat/*E. scaber* hybrid is yet to be produced. There are diploid native *Triticeae* perennial grasses which may offer an alternative way forward. However, their persistence over the range of environments encountered in the Australian cropping belt would need to be examined.

Despite the difficulties in obtaining hybrid embryos and the problems associated with partial amphiploids, *E. scaber* may still prove to be useful in breeding perennial cereals for Australia. The species has the advantage of being the most widely distributed of all the perennial *Triticeae* in Australia. In general, all wide hybridisation attempts between wheat and distant relatives have low rates of embryo recovery. Earlier embryo rescue, 24 h post-pollination, may deliver more wheat x *E. scaber* embryos. However, the continued use of hexaploid *E. scaber* would need to use selected plants from within a population, which demonstrate superior survival, as an avenue for improved drought adaptation in perennial cereals. The use of higher ploidy perennial donors has shown success in other perennial cereal development programs.

The development of hybrid perennial cereals will provide significant challenges and considerable work is required to surmount the difficulties in using *E. scaber* as a parent. However, there are potentially useful traits offered by this species in developing perennial cereals for Australia, if these difficulties can be overcome. This will require a longer term breeding strategy and investment to realise these goals.

Newell, M. (2013). Summer dormancy in *Elymus scaber* and its potential as a parent in the production of perennial cereals (Unpublished doctoral thesis). Charles Sturt University, Australia.