

Evolving Australian grains industry RD&E capacity

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Key messages

The development of purpose-built infrastructure and human capability is essential to attract partnerships with the best research parties world-wide, and to build and maintain adequate RD&E capacity for the Australian grains industry.

More than 2300 people, or about 1780 full time equivalents (FTE), were reported to contribute to the public sector grains industry RD&E in Australia during 2011/12. Nationally, between 2007/08 and 2011/12, state agencies experienced a decline in capacity of about five per cent.

Key discipline areas identified with critical shortages in 2007/08 (such as plant pathology, entomology, nematology, plant physiology, crop nutrition, soil science and grain chemistry) showed more FTEs in 2011/12 and suggests that deliberate effort has been made to restore this diminishing capacity. However, there has been a continual decline in extension, biometrics, grain market research and agricultural economics/ business management.

This declining commitment, highlights the need for public and private sectors to work together to develop effective partnerships and R&D collaboration to deliver innovation for the Australian grains industry.

Aims

1. Identify public sector capacity in human resources and infrastructure committed to grains industry RD&E activities.
2. Evaluate how the capacity is evolving by comparing key changes in capacity reported in a similar audit in 2007/08.
3. Identify priority infrastructure and human expertise that needs to be developed for effective delivery of Australian grains industry RD&E.

Method

Data on human resources and infrastructure were collected from CSIRO, state and federal primary industries agencies, and 21 universities. Information was categorised across states and organisations for the 2011/12 financial period. Infrastructure data included key sites, centres, specific infrastructure and purpose/activities. Human resource data included information on position classification, areas of expertise, scope of role (national, regional or local), gender, age, positions flagged for succession planning. Data collected in a 2007/08 audit was used as the benchmark to measure changes in capacity.

Results

Nationally, more than 2300 people (approximately 1780 FTE) were reported to contribute to public sector grains industry RD&E in 2011/12. Fifty four percent of the capacity (FTE) was located in the Southern, 26 per cent in the Western and 20 per cent in the Northern agro-ecological regions (Figure 1).

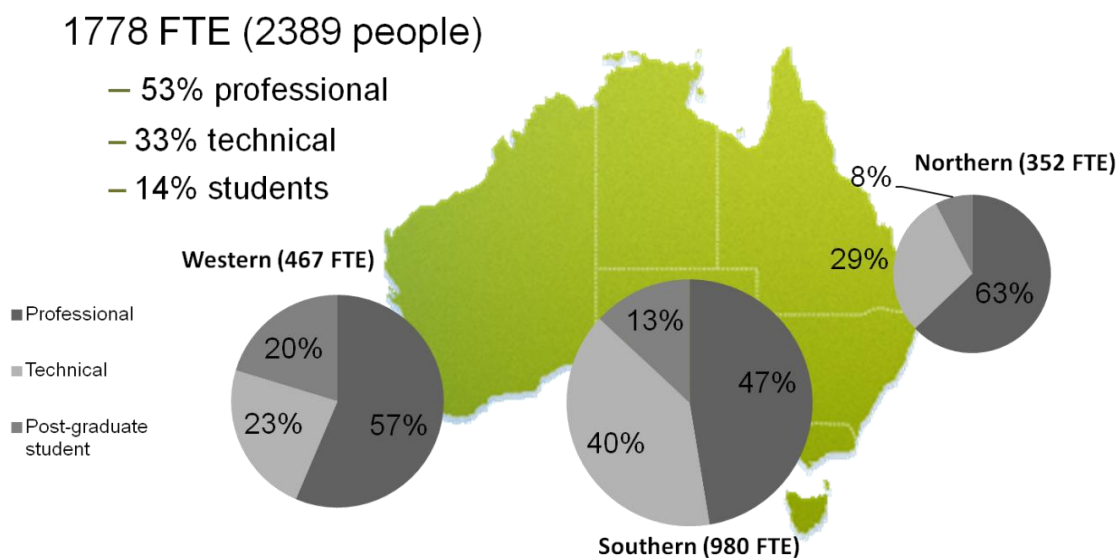


Figure 1 Distribution and categories (professional, technical and students) of people committed to public sector grains industry RD&E across the Western, Southern and Northern regions of Australia

Grains industry R&D expertise was divided into 27 categories. In 2011/12, approximately 35 per cent of the total national RD&E capacity contributed to variety development. This included people working in plant-breeding and genetics (19%) molecular biology (8%), grain chemistry (5%) and biometrics/bioinformatics (2%) (Figure 2).

Plant protection disciplines (pathology, entomology, nematology and grain storage and hygiene) accounted for about 14 per cent of the national capacity.

Farming systems areas include agronomy, modelling, weed management, soil science, nutrition, environmental/resource science, climate science, engineering, and precision agriculture. Together, these disciplines accounted for 30 per cent of the national capacity.

Key areas of expertise with particularly low levels of commitment included farm business management, agricultural economics, and market research and intelligence. Extension and capability building accounted for only three per cent of the human capacity nationally.

Comparing 2007/08 and 2011/12 data, an increase capacity (FTE) of about 10 per cent was estimated between audits. This increase was largely affected by the university sector, which reported substantial growth in numbers of professional staff and students. When students were excluded from the comparison, the increase amounted to about 5 per cent.

As a proportion of total RD&E across institutions, the CSIRO and state agency capacity declined two per cent and five per cent, respectively, with the university sector gaining an additional seven per cent share of grains industry capacity nationally.

The most striking change between audits was the decline in public sector commitment to plant breeding (Figure 3). These changes were associated with a shift of cereal breeding into private companies, while germplasm development and genetic discovery remaining largely in the public sector. This was exemplified by a 20 per cent decline in FTEs at the Department of Agriculture and Food WA, which was largely associated with the privatisation of its cereal breeding activities, into Intergrain Pty Ltd, which is owned by the Department of Agriculture and Food WA, GRDC and Monsanto.

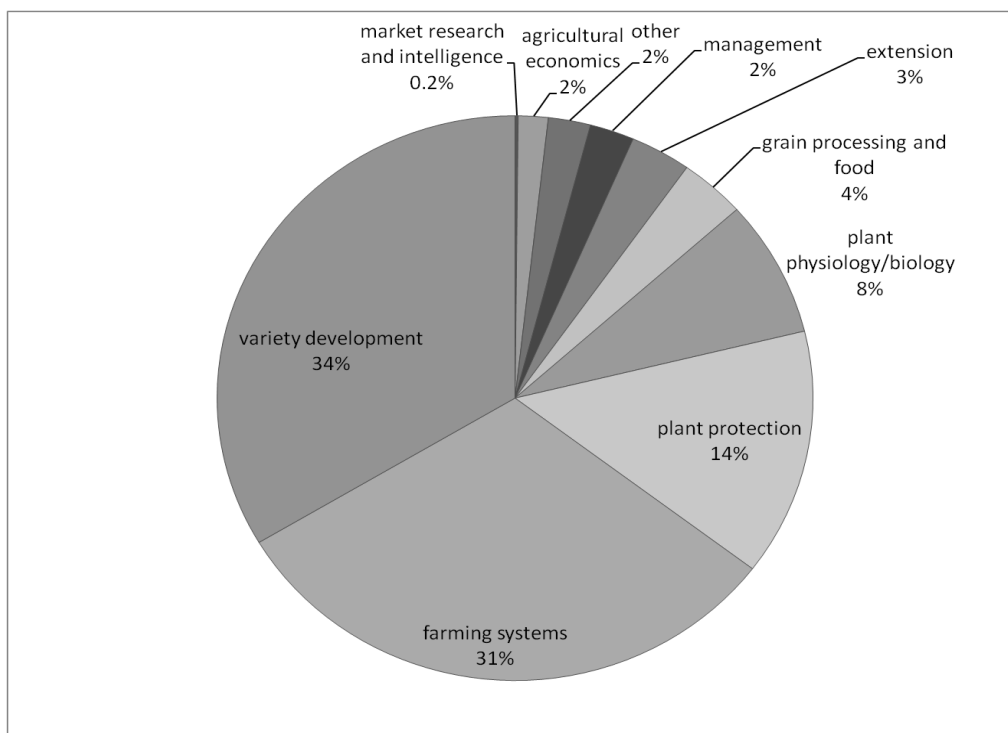


Figure 2 Percentage human resource capacity (FTE) across key classifications contributing to public sector grains industry RD&E in Australia 2011/12

There has been a deliberate effort to address some of the critical shortages in key discipline areas identified in the 2007/08 audit. Compared to 2007/08, greater capacity (FTEs) was reported for plant pathology, entomology, nematology, plant physiology/biology, crop nutrition, soil science and grain chemistry in 2011/12. However, commitment continued to decline or remained static in extension, bioinformatics/biometrics, market research and intelligence and agricultural economics/farm business management.

There was little change in gender and age between audits. Sixty four per cent were male, 45 per cent were aged between 35–40 years-old and 25 percent more than 50 years-old.

Future planning for grains industry RD&E infrastructure is aimed at creating national centres of research capability and regional hubs to develop critical mass in human resource capacity and infrastructure to underpin grains industry RD&E and industry innovation. New key infrastructure highlighted in the audit was associated with creation of the Queensland Alliance for Agriculture and Food Innovation (QAAFI), the I.A. Watson Grains Research Centre in New South Wales, AgriBio in Victoria, Australian Grains Gene Bank, Horsham, Victoria, Australian Export Grains Innovation Centre, Perth, WA, and facilities for the of evaluation of environmental stresses and GM crops.

Conclusion

The Grains Industry National RD&E Strategy contributes to building a more coordinated and collaborative approach to Australia's RD&E activities across public and private sector organisations focused on areas of industry priority. This audit provides a basis for planning future capability in skills and infrastructure to support the successful implementation of the Strategy.

The shift in human resource commitment from the public to the private sector emphasises the importance of developing effective partnerships and collaboration to undertake R&D and deliver industry innovation. This needs to be coupled with the development of world-class infrastructure and human capacity in key discipline areas to build and maintain adequate RD&E capacity for the Australian grains industry. Clearly, there remains a need to capture and understand private sector capacity to contribute to future planning.

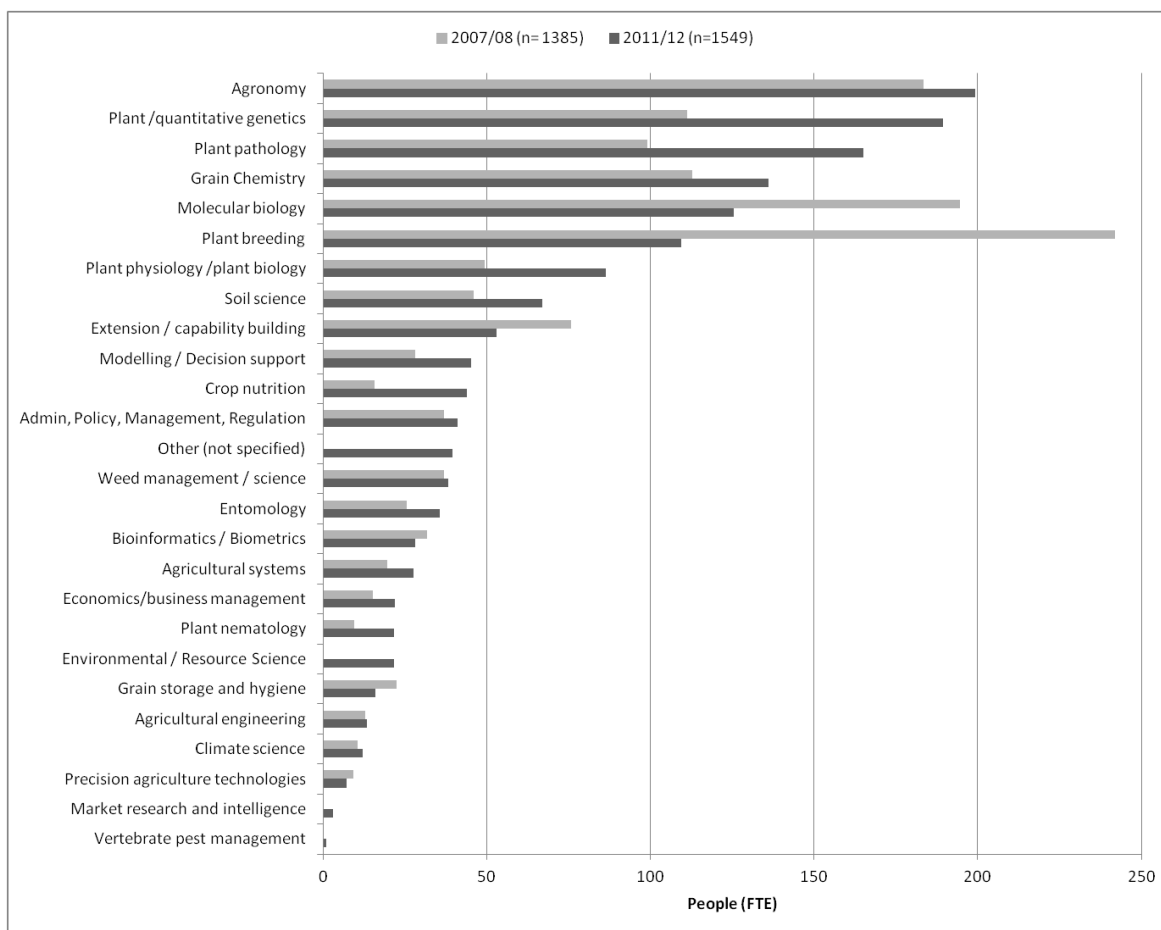


Figure 3 Comparison of national grains industry expertise/discipline capacity (FTE) in 2007/08 and 2011/12 (capacity includes professional, technical and support staff, but not students)

Key words

Grains Industry, RD&E Strategy, capacity, audit, research and development, extension

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