

Final Report

**Industry-specific impact assessment
program: Turf
2021 Aggregated Report**

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Executive Summary

What the report is about

This report describes a process for evaluating a series of project investments in research, development, and extension (RD&E) by Horticulture Innovation Australia Limited (Hort Innovation) through the Turf (TU) Industry Fund. The process has been used to identify and report the impacts from, and economic performance of, three individual project investments. These three project investments were drawn at random from a population of completed projects that was defined as projects that (1) had a final deliverable submitted during the period 1 July 2015 to 30 June 2020, (2) included Hort Innovation levy funds, (3) had at least 50% of the total investment sourced from the named industry (TU), and (4) had a total project value greater than, or equal to, \$80,000 over each project's lifetime.

Methodology

Hort Innovation originally specified that four individual RD&E projects were to be evaluated for the TU industry impact assessments. A stratified random sampling approach was used to select the four RD&E projects for evaluation from a population of 15 TU RD&E projects. The random sample was stratified across three of the four industry investment priority areas defined by the Turf Industry Strategic Investment Plan 2017-2021 and represented in the overall TU project population. The stratified random sample also was constructed to represent at least 10% (by value) of the total investment in the project population (Hort Innovation managed investment only, in nominal dollar terms).

Late in the impact assessment process, it was identified that one of the TU projects randomly selected for evaluation (TU13026) did not include any Hort Innovation TU industry levy funding. As a result, the evaluation of TU13026 was included as a stand-alone report only and the results were not included in the aggregate TU industry analysis. The final sample of three randomly selected TU projects included in the aggregate analysis was considered loosely representative of the spectrum of RD&E investments under the Hort Innovation TU levy fund for investments completed in the five-year period ending June 2020.

Each of the projects was evaluated using a logical framework approach that reported project objectives, activities and outputs, outcomes, and impacts. Impacts for each project were categorised and described in a triple bottom line framework. Some of the impacts identified were then valued in monetary terms. Project Principal Investigators, Hort Innovation personnel and industry personnel were consulted and assisted with information relevant to the project descriptions as well as to assumptions relevant to the impact valuations.

The investment criteria reported for the individual projects included the present value of costs (PVC), the present value of benefits, net present value, Benefit-Cost Ratio (BCR), Internal Rate of Return (IRR) and Modified IRR.

The investment criteria that were estimated and reported include the investment criteria for each project investment and the aggregate investment criteria for all three projects.

Results/key findings

The three RD&E projects subjected to impact assessment were found to have produced a range of economic, environmental and social impacts. Across all three projects there were 15 individual impacts identified. Of these, approximately 33% were identified as economic (5), 20% environmental (3) and 47% social (7).

Aggregate investment criteria

Total funding from all sources for the three project investments totalled \$0.66 million (present value terms) and produced estimated total expected benefits of \$1.81 million (present value terms). This gave an aggregate weighted average BCR of approximately 2.8 to 1 after 30 years at a 5% discount rate. The results are consistent with other, similar evaluations of agricultural RD&E investments conducted by the evaluation team where average BCRs have been estimated between 2 and 6 to 1.

Conclusions

The 2021 TU sample was considered loosely representative of the investment in Hort Innovations turf RD&E portfolio for the 2015/16 to 2019/20 period. Therefore, the individual project impacts and aggregate investment criteria estimated are broadly indicative of impacts and performance across the broader suite of TU RD&E undertaken by Hort Innovation. Thus, the results reported should be viewed positively but interpreted with some caution by Hort Innovation, the Australian turf industry, and policy personnel responsible for allocation of public funds.

Keywords

Impact assessment, cost-benefit analysis, turf industry, aggregate assessment, investment criteria, RD&E performance

Introduction

All research and development (R&D) and marketing levy investments undertaken by Horticulture Innovation Australia Limited (Hort Innovation) are guided and aligned to specific investment outcomes, defined through a Strategic Investment Plan (SIP). The SIP guides investment of the levy to achieve each industry's vision. The current industry SIPs¹ apply for the financial years 2016/17 – 2020/21.

In accordance with the Organisational Evaluation Framework, Hort innovation has the obligation to evaluate the performance of its investment undertaken on behalf of industry.

This impact assessment program addresses this requirement through conducting a series of industry-specific ex-post independent impact assessments of the berries (RB + BS), mango (MG), turf (TU), and nursery (NY) RD&E investment funds.

Fourteen RD&E investments (projects) were selected through a stratified, random sampling process. The industry samples were as follows:

- Four RB + BS projects were chosen worth \$1.44 million (nominal Hort Innovation investment) from an overall population of 16 projects worth an estimated \$8.59 million,
- Three MG projects worth \$1.77 million (nominal Hort Innovation investment) from an overall population of 16 projects worth approximately \$7.9 million,
- Four TU projects worth \$0.66 million (nominal Hort Innovation investment) from a total population of 15 projects worth \$4.81 million², and
- Three NY projects worth \$0.96 million (nominal Hort Innovation investment) from an overall population of 19 projects worth \$7.32 million.

The project population for each industry included projects where a final deliverable had been submitted in the five-year period from 1 July 2015 to 30 June 2020.

The projects for each industry sample were chosen such that, where possible given the small sample size required, the investments represented (1) at least 10% of the total Hort Innovation RD&E investment expenditure for each industry, and (2) the SIP outcomes (proportionally) for each industry.

This report presents a summary and the aggregate results for the impact assessment of RD&E investments made by Hort Innovation from the turf industry fund (hereafter referred to as the 2021 TU sample).

¹ The current Hort Innovation industry SIPs can be found at: <https://www.horticulture.com.au/hort-innovation/funding-consultation-and-investing/investment-documents/strategic-investment-plans/>

² One project (TU13026) was subsequently excluded from the TU aggregate analysis when it was identified that it did not include Hort Innovation levy funding. As a result, the TU13026 results are not reported in the TU aggregate analysis but the individual impact assessment report for TU13026 is included as a stand-alone evaluation in the TU aggregate report appendix.

Population & Sample Selection

Defining the Population

The population of TU Hort Innovation projects from which the 2021 TU impact assessment sample was drawn was defined as all Hort Innovation projects that had the following characteristics:

- (a) Were completed during the period 1 July 2015 to 30 June 2020 (5-year window). A completed project was defined as a project where the final deliverable was submitted and accepted by Hort Innovation between 1 July 2015 and 30 June 2020,
- (b) Included Hort Innovation levy funds (e.g. this will exclude projects funded solely through grants and/or the Hort Innovation Frontiers fund),
- (c) For multi-industry projects (MT project code), the projects must have included levy funds from the named industry (i.e. TU) representing at least 50% of the total investment in each project,
- (d) Had a total Hort Innovation managed investment value of > \$80,000 (excludes 'trivial' projects), and
- (e) Excludes 'enabler projects' not suitable for evaluation (e.g. minor use permit, mid-term review/evaluation, consultation, and SIP development type projects).

Based on this population definition, Hort Innovation personnel provided the evaluation team (AgEconPlus and Agrtrans Research) with a TU population dataset that contained 15 individual project investments with a total Hort Innovation investment value of approximately \$4.8 million (whole population).

For each project in the population a suite of project data was captured to support selection of the stratified random sample. Data included the project code, project title, project fund code, start date, and completion date. The data for each project also included financial data (total investment over each project's life) for Hort Innovation and its funding partners.

The data were integrated and rationalised by the evaluation team so that all relevant information (e.g. project code, completion date, and total Hort Innovation managed investment) could be observed and used in the sampling process.

Sample Selection Criteria

Hort Innovation originally specified that four individual RD&E projects were to be evaluated for the TU industry impact assessments. A stratified random sampling approach was used to select the four RD&E projects for evaluation from a population of 15 TU RD&E projects. The random sample was stratified across three of the four industry investment priority areas defined by the Turf Industry Strategic Investment Plan 2017-2021 and represented in the overall TU project population. The stratified random sample also was constructed to represent at least 10% (by value) of the total investment in the project population (Hort Innovation managed investment only, in nominal dollar terms).

Late in the impact assessment process, it was identified that one of the TU projects randomly selected for evaluation (TU13026) did not include any Hort Innovation TU industry levy funding. As a result, the evaluation of TU13026 was included as a stand-alone report only and the results were not included in the aggregate TU industry analysis. The final sample of three randomly selected TU projects included in the aggregate analysis was considered loosely representative of the spectrum of RD&E investments under the Hort Innovation TU levy fund for investments completed in the five-year period ending June 2020 (see Table 1 below).

Table 1: Hort Innovation RD&E Investment Value Ranges

TU SIP Outcome Area Identifier	TU SIP Outcome Area	Total Project Value ^(a) in each SIP Outcome area (\$)	SIP Outcome Area as a Proportion of TU Population (%)
1	Turf revenue has increased by five per cent plus consumer price index from targeted marketing programs.	860,952	17.9
2	Improved strategic decision making by turf growers from increased knowledge of industry data and consumer insights.	263,556	5.5
3	Improved farm practices and profitability from increased awareness and adoption of turf R&D.	3,403,194	70.7
4	Turf industry leadership program graduates are adopting innovation and using their leadership skills in business and industry decision making.	0	0.0
5	Improved industry sustainability from identifying and managing risks.	285,000	5.9
Total		4,812,702	100.0

(a) Hort Innovation managed investment.

Sample Selection Process

The sample selection was initiated using a spreadsheet that utilised only the project code, SIP code, and total Hort Innovation managed investment for each of the projects in the population. A random number technique then was applied to the 15 unique Hort Innovation RD&E projects in the TU population to generate the first random sample of projects for 2020/21 evaluations.

The first set of four randomly selected projects was checked against the sample selection criteria (described previously). Where a criterion was not met (for example, the total Hort Innovation investment in the sample did not meet the 10% minimum value hurdle), individual projects were progressively removed based on the sample criteria required and then replaced with alternative, randomly drawn projects until all stratification criteria were met. The final sample is shown in Table 2.

The final stratified, random sample of four Hort Innovation TU RD&E projects had a total Hort Innovation managed investment value of approximately \$0.66 million (nominal dollars) representing approximately 13.7% of the overall Hort Innovation managed investment in the population (\$4.8 million). Further, for the SIP Outcome area criterion, one project was selected for SIP Outcome area 1, one for Outcome area 2, and two for Outcome area 3 (one of which was TU13026 that was later excluded from the aggregate analysis). There were no projects in the TU population that were aligned with Outcome area 4 and only one project was selected across Outcome areas 2 and 5 combined because of (a) the small number of projects required for the sample size, and (b) based on the proportion of projects aligned with Outcomes 2 and 5 in the overall population.

Table 2: Stratified Random Sample of Four TU RD&E Projects Selected for Impact Assessment (by Project Code)

No.	Project Code	Project Title	Total Hort Innovation Investment (\$)	Start Date	End Date	SIP Outcome Area (Identifier)
1	TU13029	Industry development services for the Queensland turf industry	223,538	31/05/2014	31/05/2017	O3
2	TU13034	Developing a National Standard for turf as an erosion control measure	102,621	30/06/2014	1/07/2017	O1
3	TU16001	Turf industry statistics and research 2016/17	84,440	15/10/2016	14/10/2017	O2
4	TU13026	State of the art hydro-sprigging technology to expand the Australian turfgrass industry ³	250,291	30/04/2014	31/05/2016	O3
Total Hort Innovation Investment			660,890			

³ This project was subsequently excluded from the TU aggregate analysis when it was identified that it did not include Hort Innovation investment funding. TU13026 results are not reported in the aggregate analysis but are included as an appendix to this report.

General Evaluation Method

The individual impact assessments followed general evaluation guidelines that are well entrenched within the Australian primary industry research sector including Research and Development Corporations, Cooperative Research Centres, State Departments of Agriculture, and some universities. The approach included both qualitative and quantitative assessments that are in accord with the impact assessment guidelines of the CRRDC (CRRDC, 2018). The quantitative assessments used cost-benefit analysis as its principal tool.

The evaluation process involved identifying and briefly describing project objectives, activities and outputs, outcomes, and impacts for each RD&E investment selected for the 2021 TU sample. The principal economic, environmental, and social impacts were then summarised in a triple bottom line framework.

Some, but not all, of the impacts identified were then valued in monetary terms. The decision not to value certain impacts was due either to a shortage of necessary evidence/data, a high degree of uncertainty surrounding the potential impact, or the likely low relative significance of the impact compared to those that were valued. The impacts valued are therefore deemed to represent the principal benefits delivered by the project. However, as not all impacts were valued, the investment criteria reported for individual investments potentially represent an underestimate of the performance of that investment.

Impacts

Summary of Project Impacts

The following section summarises the key qualitative results for three randomly selected TU projects that were subjected to impact assessment as part of the 2021 Hort Innovation industry-specific impact assessment program. The impacts and potential impacts from each project investment were identified, described, and then classified into economic, environmental, and social impacts, on an individual project basis. The principal impacts and potential impacts for each project are shown in Table 3 (economic impacts), Table 4 (environmental impacts), and Table 5 (social impacts).

Table 3: Principal Economic Impacts by Project

Economic	TU13029	<ul style="list-style-type: none"> Additional turf grower profit (lower costs of production and additional sales) as a result of increased R&D and marketing output adoption.
	TU13034	<ul style="list-style-type: none"> Additional profitable turf sales into the erosion management market.
	TU16001	<ul style="list-style-type: none"> Improved financial performance for turf businesses that are able to use project generated data to make more informed and profitable business decisions (e.g., more informed product pricing). Improved resource allocation – industry research, marketing and biosecurity budgets that better reflect the ‘real world’ situation (and realise an efficiency dividend). Improved policy development for the turf industry based on sound statistical data.

Table 4: Principal Environmental Impacts by Project

Environmental	TU13029	<ul style="list-style-type: none"> An improvement in the QLD environment with adoption of research findings and best practice measures that facilitate sustainable turf production.
	TU13034	<ul style="list-style-type: none"> Reduced environmental damage during construction and operation of engineered works.
	TU16001	<ul style="list-style-type: none"> Nil.

Table 5: Principal Social Impacts by Project

Social	TU13029	<ul style="list-style-type: none"> Additional turf grower capacity and understanding of innovation and the role of R&D outputs in their businesses. Improved grower ability to respond to environmental, biosecurity, and water use efficiency issues. Additional extension, communication, and training capacity – for both the QLD Industry Development Officer and national Business Development Manager. Contribution to improved regional community wellbeing from spill-over income and employment benefits as a result of a more profitable and sustainable turf industry.
	TU13034	<ul style="list-style-type: none"> Additional policy maker, landscape architect, engineer and researcher skills and knowledge in turf use and erosion control.

		<ul style="list-style-type: none"> • Contribution to improved regional community wellbeing from spill-over income and employment benefits as a result of a more profitable turf industry.
	TU16001	<ul style="list-style-type: none"> • Capacity built in industry and capacity built in researchers in the collection and interpretation of data. • Contribution to improved regional/peri-urban community wellbeing from spill-over income and employment benefits as a result of a more profitable turf industry.

Overview of Impact Types

The specific, project level impacts then were generalised into broad impact categories/types to describe the overall economic, environmental, and social impacts of the total Hort Innovation RD&E portfolio, as represented by the stratified, random sample of projects assessed. Each individual project impact is represented by one tick mark (✓) in 3 (broad economic impact types), 2 (broad environmental impact types) and 3 (broad social impact types).

Across all 3 projects assessed there were 15 individual impacts identified. Of these, approximately 33% were identified as economic (5), 20% environmental (3) and 47% social (7).

Table 6: Impacts by Broad Economic Impact Type for each Project in the Hort Innovation 2021 TU Impact Assessment Sample

Project Code	Economic Impact Type		
	Improved turf grower profitability.	Improved industry resource allocation – research, marketing, and biosecurity.	Improved policy development.
TU13029	✓		
TU13034	✓		
TU16001	✓	✓	✓
Impact Count	3	1	1

Table 7: Impacts by Broad Environmental Impact Type for each Project in the 2021 TU Impact Assessment Sample

Project Code	Environmental Impact Type	
	Progress toward more sustainable turf production.	Reduction in infrastructure construction and operation environmental damage.
TU13029	✓	
TU13034	✓	✓
TU16001		
Impact Count	2	1

Table 8: Impacts by Broad Social Impact Type for each Project in the 2021 TU Impact Assessment Sample

Project Code	Social Impact Type		
	Increased scientific knowledge and capacity.	Increased turf grower and industry association knowledge and capacity.	Productivity/ profitability benefits having a flow-on effect to support improved regional/peri-urban community wellbeing.
TU13029		✓	✓
TU13034	✓		✓
TU16001	✓	✓	✓
Impact Count	2	2	3

Results

Overview

The following sections present the estimated investment criteria for each of the three Hort Innovation TU RD&E project investments evaluated and for all three projects in aggregate. While the total investment for each project is usually a combination of resources from Hort Innovation and other funding partners, for the TU projects randomly selected, Hort Innovation was the only investor.

The investment costs for all resources (cash and in-kind) were expressed in 2020/21 dollar terms using the Implicit Price Deflator for Gross Domestic Product (ABS, 2021). All benefits after 2020/21 also were expressed in 2020/21 dollar terms. All costs and benefits were discounted to 2020/21 (year of evaluation) using a discount rate of 5% and using a reinvestment rate of 5% for calculating the Modified Internal Rate of Return (MIRR) as per the CRRDC Impact Assessment guidelines. The base analyses used the best available estimates for each variable, notwithstanding a level of uncertainty for many of the estimates. All individual analyses ran for the length of the individual project investment period plus 30 years from the last year of investment.

Results presented include the Present Value of Costs (PVC), estimated Present Value of Benefits (PVB), Net Present Value (NPV), Benefit-Cost Ratio (BCR), Internal Rate of Return (IRR) and MIRR. Definitions for these terms may be found in the Glossary of Economic Terms at the end of this report. Impacts from all 3 projects were valued in monetary terms.

Investment Criteria by Project

The individual project investment criteria for the total investment for the 2021 TU sample is reported in Table 9. Hort Innovation contributed 100% of the funding for all three projects.

*Table 9: Investment Criteria for Total Investment by Individual TU Project
(30 years after last year of investment, 5% discount rate)*

Project Code	Project Title	PVB (\$m)	PVC (\$m)	NPV (\$m)	BCR	IRR (%)	MIRR (%)
TU13029	Industry development services for the Queensland turf industry	0.80	0.37	0.43	2.14	11.3	7.3
TU13034	Developing a National Standard for turf as an erosion control measure	0.57	0.16	0.42	3.62	14.5	8.8
TU16001	Turf industry statistics and research 2016/17	0.45	0.12	0.33	3.62	39.8	9.3

The total investment per project (PVC) across all three TU RD&E investments (Table 9) ranged from \$0.12 million to \$0.37 million (present value terms). Estimated benefits (PVB) ranged from \$0.45 million to \$0.8 million (present value terms). The highest NPV (\$0.43 million) was reported for project TU13029 (*Industry development services for the Queensland turf industry*). Projects TU13034 and TU16001 recorded equal highest BCRs.

Aggregate Investment Criteria (3 Projects)

Table 10 provides the aggregate investment criteria for all three projects for both total investment and the Hort Innovation investment – Hort innovation was the only investor in all 3 projects.

Table 10: Aggregate Investment Criteria for Total Investment in all Three Projects
(5% discount rate)

Investment Criteria	Years after last year of investment						
	0	5	10	15	20	25	30
PVB (\$m)	0.03	0.53	0.99	1.32	1.53	1.69	1.81
PVC (\$m)	0.60	0.66	0.66	0.66	0.66	0.66	0.66
NPV (\$m)	-0.57	-0.12	0.34	0.66	0.87	1.03	1.16
BCR	0.05	0.82	1.51	2.01	2.33	2.57	2.77
IRR (%)	negative	negative	10.8	14.1	15.1	15.5	15.7
MIRR (%)	negative	negative	8.2	9.2	9.0	8.6	8.3

The results in Table 10 show that the weighted average BCR for all three projects was approximately 2.8 to 1 for the total investment after 30 years. The simple average BCR was approximately 3.1 to 1 (derived from Table 9). The aggregate investment criteria were positive after ten years (BCR of 1.51).

Source of Benefits

Table 11 shows the contribution of each project to the total PVB (Total Investment)

Table 11: Contribution of Benefits by Source

Project Code	Project Title	PVB (\$m)	Proportion of Total PVB (%)
TU13029	Industry development services for the Queensland turf industry	0.80	44.0
TU13034	Developing a National Standard for turf as an erosion control measure	0.56	31.1
TU16001	Turf industry statistics and research 2016/17	0.45	24.9
Total		1.81	100.0

Leverage

Leverage is expressed here as the ratio of non-Hort Innovation investment to Hort Innovation investment. None of the three projects were supported with external funding.

The leverage ratios by project are provided in Table 12.

Table 12: Leverage Ratio by Project

Project Code	Project Title	Leverage Ratio ^(a)
TU13029	Industry development services for the Queensland turf industry	0.00
TU13034	Developing a National Standard for turf as an erosion control measure	0.00
TU16001	Turf industry statistics and research 2016/17	0.00

(a) Ratio of non-Hort Innovation managed investment to Hort Innovation investment

Conclusions

Impact assessments were carried out on three randomly selected Hort Innovation TU industry RD&E investments that were completed with a final deliverable submitted in the year ended June 2020. These investments produced a range of economic, environmental and social impacts. Across all three projects assessed, 15 individual impacts were identified. Of these, 33% were identified as economic (5), 20% environmental (3) and 47% social (7).

Total funding from all sources for the three project investments totalled \$0.66 million (present value terms) and produced estimated total expected benefits of \$1.81 million (present value terms). This gave an aggregate weighted average BCR of approximately 2.8 to 1 after 30 years at a 5% discount rate. The results are consistent with other, similar evaluations of agricultural RD&E investments conducted by the evaluation team where average BCRs have been estimated between 2 and 6 to 1. For example, an aggregate assessment of some 288 evaluations of RD&E investments across all 15 Australian Research and Development Corporations (RDCs) funded by the CRRDC generated a weighted average BCR of approximately 4.5 to 1 (Agtrans Research, AgEconPlus & EconSearch, 2016).

The sample of projects evaluated:

- represented more than 10% of the total Hort Innovation lifetime funding of projects with a final deliverable submitted in the year ended 30 June 2020,
- was loosely representative across the specific industry SIP outcomes given the small sample size, and
- was drawn at random.

Some, but not all, of the impacts identified for each project investment were valued as part of the evaluation process. The decision not to value certain impacts was, in general, due either to a shortage of necessary evidence/data, a high degree of uncertainty surrounding the potential impact, or the likely low relative significance of the impact compared to those that were valued. The impacts valued are therefore deemed to represent the principal benefits delivered by the RD&E project investments. As not all impacts were valued, it is likely that the estimated investment criteria reported are an underestimate of the performance of the Hort Innovation RD&E investment evaluated.

The 2021 TU sample was considered loosely representative of the investment in Hort Innovations overall TU industry RD&E portfolio for the 2015/16 to 2019/20 period. Therefore, the impacts and aggregate investment criteria estimated are broadly indicative of impacts and performance across the broader suite of TU RD&E undertaken by Hort Innovation.

Thus, the results reported should be viewed positively but interpreted with some caution by Hort Innovation, the Australian turf industry, and policy personnel responsible for allocation of public funds.

Glossary of Economic Terms

Cost-benefit analysis:	A conceptual framework for the economic evaluation of projects and programs in the public sector. It differs from a financial appraisal or evaluation in that it considers all gains (benefits) and losses (costs), regardless of to whom they accrue.
Benefit-cost ratio:	The ratio of the present value of investment benefits to the present value of investment costs.
Discounting:	The process of relating the costs and benefits of an investment to a base year using a stated discount rate.
Internal rate of return:	The discount rate at which an investment has a net present value of zero, i.e. where present value of benefits = present value of costs.
Investment criteria:	Measures of the economic worth of an investment such as Net Present Value, Benefit-Cost Ratio, and Internal Rate of Return.
Modified internal rate of return:	The internal rate of return of an investment that is modified so that the cash inflows from an investment are re-invested at the rate of the cost of capital (the re-investment rate).
Net present value:	The discounted value of the benefits of an investment less the discounted value of the costs, i.e. present value of benefits - present value of costs.
Present value of benefits:	The discounted value of benefits.
Present value of costs:	The discounted value of investment costs.

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Appendices

The following table lists the titles of the individual impact assessment reports that form the appendices to the turf (TU) industry specific impact assessment.

Table 13: Individual Impact Assessment Report Titles: Turf 2021 Sample

Project Code	Project Title
TU13029	Industry development services for the Queensland turf industry
TU13034	Developing a National Standard for turf as an erosion control measure
TU16001	Turf industry statistics and research 2016/17
TU13026	State of the art hydro-sprigging technology to expand the Australian turfgrass industry ⁴

⁴ This project was subsequently excluded from the TU aggregate analysis when it was discovered that it did not include Hort Innovation investment funding. TU13026 results are not reported in the aggregate analysis but are included as an appendix to this report.

Acknowledgements

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Abbreviations

RD&E	Research, Development and Extension
ABS	Australian Bureau of Statistics
BCR	Benefit-Cost Ratio
CRRDC	Council of Rural Research and Development Corporations
FNQ	Far North Queensland
Hort Innovation	Horticulture Innovation Australia Ltd
IRR	Internal Rate of Return
MIRR	Modified Internal Rate of Return
NPV	Net Present Value
PVB	Present Value of Benefits
PVC	Present Value of Costs
R&D	Research and Development
RDC	Research and Development Corporation