

Te Uru Rākau



New Zealand Forest Service

Native Nursery Survey 2022 Main Report



**Te Kāwanatanga
o Aotearoa**
New Zealand Government



Publisher

Te Uru Rākau – New Zealand Forest Service
Charles Fergusson Building, 34–38 Bowen Street
PO Box 2526, Wellington 6140, New Zealand
Tel: 0800 00 83 33

This publication is available on the
Ministry for Primary Industries website at
www.mpi.govt.nz

ISBN No: 978-1-991087-32-4 (online)

Disclaimer

While every effort has been made to ensure the
information in this publication is accurate,
Te Uru Rākau – New Zealand Forest Service does not
accept any responsibility or liability for error of fact,
omission, interpretation or opinion that may be present,
nor for the consequences of any decisions based on this
information.

CONTENTS

List of Tables	4
List of Figures	5
The Nursery Sector	6
1. Executive summary	7
Nursery Survey 2022	7
Key findings	9
Enablers	9
Inhibitors	10
Discussion	11
2. Purpose, objectives and method	12
Purpose and objectives	12
Method	12
Approach to analysing and reporting the survey results	13
3. Current state of the native nursery sector	14
Summary	14
Actual and potential seedling production	15
Production capacity	17
Native tree seedling production and sale	21
Profile of current native tree seedling producers	23
Current production and sale of native tree seedlings compared with previous financial year	25
The types and locations of current producers' markets	27
Demand for eco-seeds	29
4. Future production intentions	30
Summary	30
Likely future production and sale of native tree seedlings	31
Profile of future "producers" (in comparison to current "producers")	32
Constraints and limitations impacting future production	34
5. Production enablers and inhibitors	36
Summary	36
Workforce	37
Appendix A: Respondent profile	57
Appendix B: Questionnaire	58

LIST OF TABLES

Table 1: Survey response

Table 2: Current total productive area of nursery

Table 3: Current total productive land area as a percentage of total available land area

Table 4: Maximum number of seedlings nursery could grow given its current productive area

Table 5: Seedling production in the most recent financial year as a percentage of production capacity

Table 6: Types of seedlings produced and sold in the most recent financial year

Table 7: Number of each type of seedling produced and sold in the most recent financial year

Table 8: Types of tree seedlings produced and sold in the most recent financial year

Table 9: Number of types of tree seedlings produced and sold in the most recent financial year

Table 10: Profile of current producers of native tree seedlings

Table 11: Comparison of the production and sale of native tree seedlings in the most recent financial year with previous financial year

Table 12: Percentage difference between the production and sale of native tree seedlings in the most recent financial year compared with previous financial year

Table 13: Types of customers

Table 14: Location of customers

Table 15: Furthest area business sends seedlings to

Table 16: The demand for eco-seeds

Table 17: Interest in producing and selling more native tree seedlings – Current producers

Table 18: Interest in starting to produce and sell native tree seedlings – Current non-producers

Table 19: Profile of future producers of native tree seedlings (in comparison to current producers)

Table 20: Barriers to the production of native tree seedlings

Table 21: Worker numbers – Most recent financial year

Table 22: Worker origins

Table 23: Worker numbers – Most recent financial year compared with previous and coming financial year

Table 24: Difficulties recruiting workers most recent financial year

Table 25: Extent to which workers (in the most recent financial year) had NZQA-level qualifications

Table 26: Percentage of workers at each NZQA-level qualification

Table 27: Percentage of workers with qualifications in agriculture, horticulture or nursery production

Table 28: Training practices

Table 29: Technologies and automation systems currently being used

Table 30: Technologies and automation systems respondents would use to increase performance/production

Table 31: Technologies and automation systems respondents would most prefer to use to increase performance/production

Table 32: Opinions about subject areas relating to native tree production that should be investigated

Table 33: Opinions about subject areas relating to native tree production that should be investigated first (most preferred)

Table 34: Conducted or funded research and development

Table 35: Business plans next few years

Table 36: Changes made given business plans

Table 37: Changes made as a result of business plans

Table 38: Most important change made as a result of business plans

Table 39: Capital investment in making changes

Table 40: Intended changes not made

Table 41: Reasons for intended changes not made

Table 42: Most important reason for intended changes not made

Table 43: Awareness of investment partners

Table 44: Respondent profile

LIST OF FIGURES

Figure 1: Interest in producing more or starting to produce more native tree seedlings

Figure 2: Short-term business plans

Figure 3: Operational changes made in most recent financial year by nurseries planning to “grow”

Figure 4: Reasons nurseries planning to “grow” were unable to make operational changes

THE NURSERY SECTOR

Native trees and forests will play a major part in how we address climate change — Aotearoa New Zealand’s most pressing long-term environmental challenge. Through Budget 22, the Government has invested to reduce barriers to establishing native forests through the Climate Emergency Response Fund.

By planting more trees with a focus on indigenous (native) species, we can create long-term carbon sinks while managing erosion and enhancing biodiversity, soil health, and water quality.

In 2022, Te Uru Rākau – New Zealand Forest Service commissioned a survey and asked for the Nursery sector’s help to understand the barriers it faces.

I’d like to acknowledge all those who participated in the survey and say thank you to the nurseries for taking the time to complete the survey. The findings in this summary report will help to inform the Native Afforestation Programme and the work we will do with the sector to address these challenges. We hope it will also support nurseries’ capability and capacity to grow native seedlings and enhance economic, social, environmental, and cultural outcomes.



Alex Wilson
Director Forestry Engagement and Advice
Te Uru Rākau – New Zealand Forest Service
Ministry for Primary Industries

1. EXECUTIVE SUMMARY

This report presents the results of an online survey completed with the commercial nursery sector in New Zealand on behalf of Te Uru Rākau – New Zealand Forest Service. The Nursery Survey 2022 was completed to help understand the current state of the native nursery sector in Aotearoa New Zealand and inform the Native Afforestation Programme and other related workstreams.

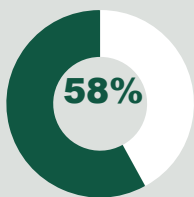
A total of 467 nurseries were invited to complete the survey on 10 November 2022 and by the closing date of 23 January 2023, valid responses had been received from 140 respondents. This represents a response rate of 30 percent. If this is calculated on the number of nurseries that were contactable (n=299), the response rate is 47 percent.

The key results of the survey are presented in the following infographic.

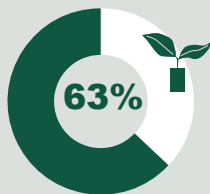
Nursery Survey 2022

What is the current state of the sector?

The average nursery is ...

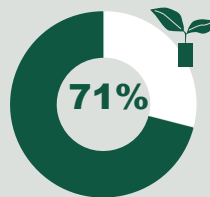


- utilising **58%** of its **productive land area** (currently an average of 4.4 hectares is being utilised).

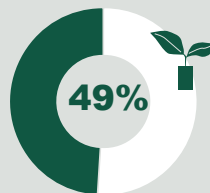


- producing at **63%** of its **current capacity**.

Current native tree seedling production



- **71%** of all nurseries **produced and sold seedlings** in their most recent financial year.
- most produced and sold up to and including **5,000 seedlings (35%)**, between **5,001 and 20,000 (16%)** or between **20,001 and 50,000 (14%)**.



- **49%** **produced more** than in the previous financial year.
- over one-third who produced more, produced **51% more plus (37%)**.

Note: These production averages differ significantly by nursery size.

Who are the current producers of native tree seedlings?

Producers of native tree seedlings are ...

- mostly **private (86%)**, **owner-operated businesses (75%)**.
- approximately half are “**small**” businesses with up to and including 5 workers (**48%**). Another 34% are “**medium**” sized businesses, with between 6 and 19 workers, while 18% are “**large**” businesses, with 20 or more.
- Mostly operating from **one site**; typically in the North of the North Island (**47%**) or the Central Region (**38%**).

- **8%** identify as a **Māori business**.
- **39%** distribute **nationally**.

What are the sector’s future intentions regarding the production of native tree seedlings?

The sector appears to be very interested in increasing its production or starting to produce seedlings ...



69% of all nurseries (current “producers” and “non-producers”) stated they would **produce more** or **start producing**.

interest is **greatest** amongst current “**producers**” compared with “**non-producers**” (**77% cf. 48%**).

amongst those not interested, the greatest **inhibitors** are **capital, infrastructure** and an **unwillingness to change**.

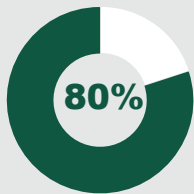
Key production enablers for “producers”

Business development is on nurseries’ agenda



Over one-half of all nurseries **want their business to “grow” (56%)**...

- “medium-large” nurseries are more likely to have these plans compared with “small” nurseries (71% cf. 38%).
- **80% of businesses wanting to “grow” have made operational changes** in their most recent financial year.
- these changes include increasing their productive land area (**74%**), building new infrastructure such as buildings (**69%**), changing propagation practices (**61%**), changing business practices (**64%**), increasing machinery use (**59%**), and/or increasing the use of technology (**56%**).



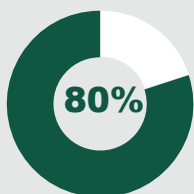
Technology is recognised as an enabler



Two-thirds (67%) of all nurseries currently use at least one of the technologies covered by the survey, however, this is predominantly the “medium-large” nurseries.

These “medium-large” nurseries are predominantly using technology such as **electronic inventory systems (53%)**, **environmental monitoring (53%)** and **automated potting (48%)**.

Nurseries are investing in their business



Most nurseries wanting to “grow” have invested capital to make operational changes (**80%**) ...

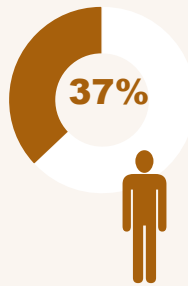


over one-half (**52%**) **invested \$100,001 or more** in their most recent financial year, resulting in a mode in the \$100,000-500,000 band and an average of \$360,000.

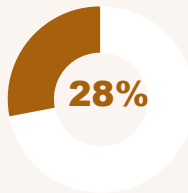
Key production inhibitors for “producers”

Workforce recruitment and skill-based inhibitors

- Forty percent of all nurseries want more workers; however ...
 - **37%** have experienced **recruitment issues**.
 - in addition, there are **skill issues**: while 72% report they have workers with **NZQA-level** qualifications, they mostly have workers with only **Level 1-3 qualifications**.
 - also, most (**53%**) say 30% or less of their NZQA-qualified workers have **agricultural, horticultural or nursery production qualifications**.
 - and very **few** having **formal training practices** in place (most is on-the-job).



Research and development is being undertaken by a relatively small number of nurseries



- One-in-four of all nurseries report **undertaking/funding R&D** in their most recent financial year (**28%**) ...
- while “medium-large” nurseries were **more likely** to report undertaking/funding R&D than “small” nurseries, the percentage is still relatively low (**35%** cf. 19%).
- **seed supply and storage (28%)**, and **germination rates (14%)** are the two subject areas **most frequently identified** for R&D.



A lack of investment capital is holding back nurseries wanting to “grow”

- Over three-quarters of nurseries wanting to “grow” have not been able to make the operational changes they want to make (79%) ...
- these include increasing the use of technology (45%), increasing productive land area (42%), building new infrastructure such as buildings (42%), employing more staff (39%) and increasing machinery use (37%).
- 65% identified a lack of capital as the main reason for not making changes; others included a lack of time (50%), a lack of skilled staff (37%) and not having the right infrastructure (33%).
- 63% for those wanting to “grow” their business were unaware of any **possible investors**.

Key findings

Based on the results of the Nursery Survey 2022, the commercial nursery sector largely comprises “**small**” (48 percent) to “**medium**” (34 percent) sized, **private** (86 percent), **owner-operated** businesses (75 percent). Less than one-in-five nurseries can be described as “**large**” nurseries (18 percent).¹

This is, in turn, reflected in the average nursery having **4.4 hectares** of productive land. However, only **58 percent of the available** productive land is currently being used.

The average nursery has the capacity to produce a maximum of **690,000 seedlings** (of all plant types) but is currently producing at **63 percent of that capacity**.

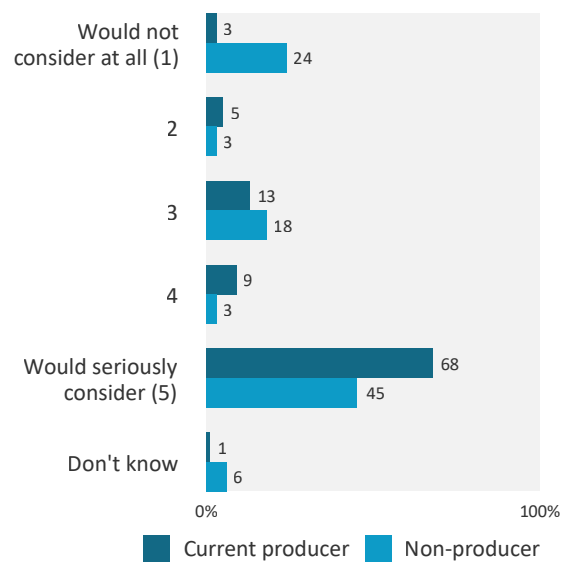
Although almost three-quarters of all nurseries produced and sold **native trees seedlings** in their most recent financial year (71 percent), the size and productive capability of most nurseries may account for levels of production that are **currently relatively low**.

Two-thirds produced and sold up to and including 50,000 seedlings (65 percent); with most producing up to and including 5,000 (35 percent), between 5,001 and 20,000 (16 percent) or between 20,001 and 50,000 (14 percent).

Notwithstanding this, the production of native tree seedlings appears to be **on the rise**, with approximately one-half of current “producers” (49 percent) reporting their nursery **increased** its production in its most recent financial year in comparison to the previous year. Significantly, over 50 percent of these “producers” stated they had produced **51 percent or more seedlings**.

This trend is, in turn, reflected in future production intentions, with over two-thirds of all nurseries stating they would be interested in **producing more or starting to produce** native tree seedlings (68 percent). This interest is greatest amongst current “producers” (77 percent) compared with “non-producers” (48 percent) (Figure 1 overleaf).

Figure 1: Interest in producing more or starting to produce more native tree seedlings

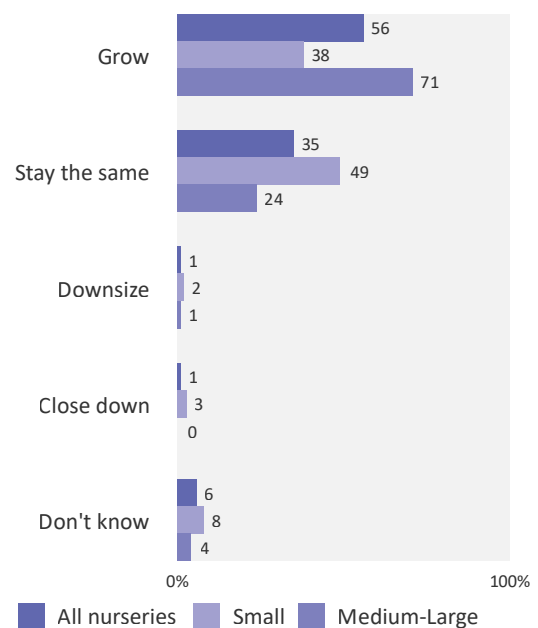


Against this background, we note here the enablers and inhibitors to increasing the production of native tree seedlings.

Enablers

The first and possibly most important enabler is the fact that over one-half of all nurseries have a **mind-set based on growing their business** (56 percent) (Figure 2).

Figure 2: Short-term business plans

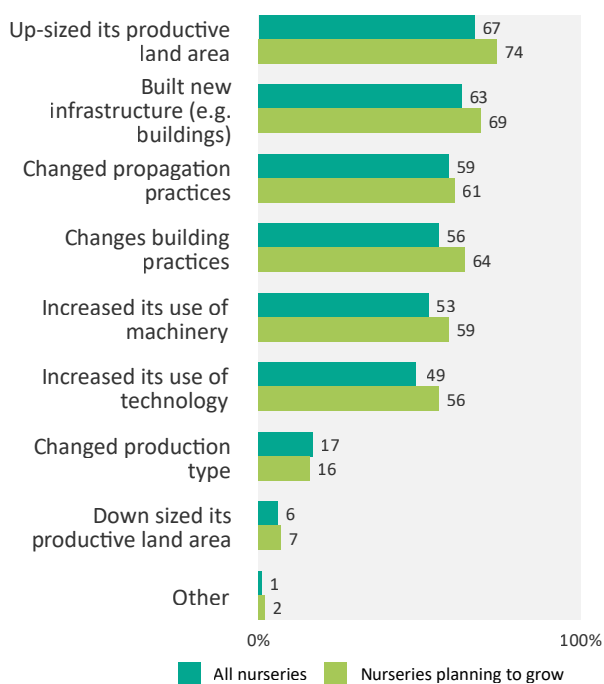


¹ For the purposes of this report, a “small” nursery is defined as having up to and including 5 workers, a “medium” sized nursery between 6-19 workers and a “large” nursery 20 or more workers.

As the figure shows, this is particularly the intention of “medium-large” nurseries, which comprise 52 percent of the sector. As a group, they were almost twice as likely to state they want to “grow” their business compared with “small” nurseries (71 percent and 38 percent respectively). In contrast, “small” nurseries were more likely to state they want to ‘stay more or less the same size’ (49 percent).

The fact that many nurseries want their business to “grow” is, in turn, reflected in 80 percent of these nurseries making **operational changes** to their business in the most recent financial year. The changes most frequently being made included increasing productive land area (74 percent); building new infrastructure such as buildings (69 percent); changes business practices (64 percent); changing propagation practices (61 percent); increasing machinery use (59 percent); and increasing technology use (56 percent) (Figure 3).

Figure 3: Operational changes made in most recent financial year by nurseries planning to “grow”



Looking particularly at the technological changes being made, most of the nurseries wanting to “grow” their business reported **already making good use of technology** (76 percent stated they were making use of at least one of the technologies covered by the survey and in most cases, they were making use of multiple technologies).

Furthermore, when asked, there was a **general recognition of the benefits** of using technology to increase productivity/performance, particularly the use of automated potting systems (61 percent), environmental

monitoring (59 percent), electronic inventory systems (53 percent) and seed sowing systems (47 percent).

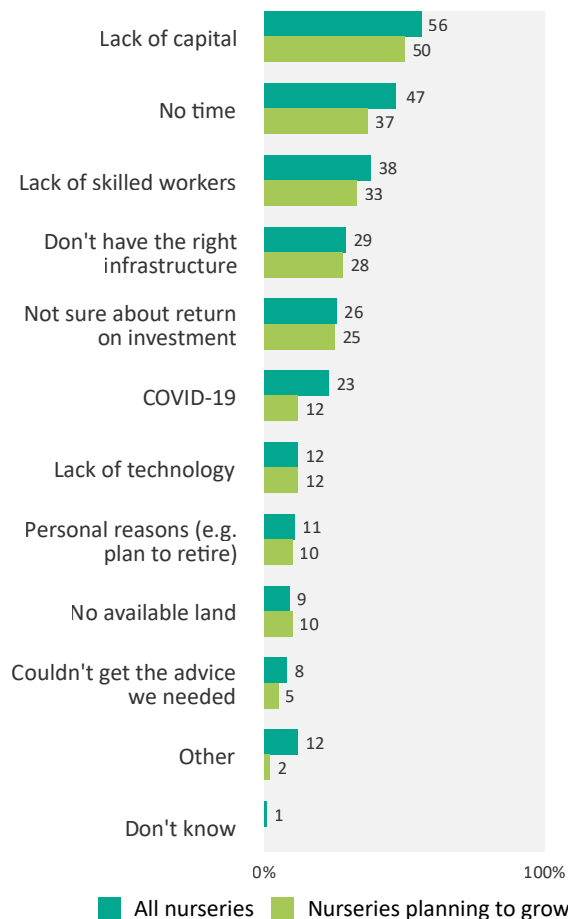
In addition, and perhaps as a sign of their commitment to making operational changes, 85 percent of nurseries wanting to “grow” their business **invested capital** in making these changes in their most recent financial year, with over one-half (52 percent) investing \$100,001. The average was in excess of \$350,000.

Inhibitors

While investment capital is an enabler for some nurseries wanting to “grow” their business, a lack of investment capital is an inhibitor for others.

Over three-quarters of nurseries wanting to “grow” their business stated they were not able to make all the operational changes they wanted to make in their most recent financial year (79 percent), and this was primarily because of a lack of capital (Figure 4). In fact, two-thirds of nurseries unable to make changes identified this as the main reason (65 percent).

Figure 4: Reasons nurseries planning to “grow” were unable to make operational changes



Consequently, there have been many **lost opportunities**. For example, 45 percent of these nurseries stated they were unable to increase their use of technology, 42 percent were unable to increase their productive land area, 42 percent were unable to build new infrastructure such as buildings, 39 percent were unable to employ more staff, and 37 percent were unable to increase their machinery use.

This might also account for the fact that one-third (37 percent) stated they had conducted or funded **research and development** in their most recent financial year, despite considerably more being able to identify the subject areas that most merited investigation (viz. seed supply and storage, and germination rates).

Compounding the situation relating to investment capital is the fact that two-thirds of nurseries wanting to “grow” were **unaware** of possible investors (63 percent).

Another key reason why nurseries wanting to “grow” their business were not able to make the operational changes they wanted to make was because of a **lack of qualified/skilled staff**. In this regard, while most stated they have workers with NZQA-level qualifications (78 percent), these workers tended to have only level 1-3 qualifications.

Furthermore, relatively few (24 percent) stated that 51 percent or more (i.e. most) of their current NZQA-qualified workers had formal agricultural, horticultural or nursery production qualifications.

In addition, while 82 percent provided on-the-job training, relatively few had formal training practices (at best, 16 percent had training for the NZ Certificate in Horticulture in their most recent financial year).

Compounding this situation, 40 percent had **experienced difficulties** recruiting skilled staff.

Discussion

Although current “producers” show a strong interest in increasing their production of native tree seedlings (as well as some “non-producers”) and many are “medium-large” nurseries which are taking steps to upscale by increasing their productive land and making other changes to improve their productivity/performance, the inhibitors outlined above have the potential to put a brake on these nurseries’ plans.

This, together with other factors (e.g. the impact of climate change) place a serious question mark over timeframes of their plans and it may, therefore, be necessary to consider either supporting the sector and/or adopting other business models in order to achieve the goals and targets of the Native Afforestation Programme.

2. PURPOSE, OBJECTIVES AND METHOD

Purpose and objectives

The Nursery Survey 2022 was completed for Te Uru Rākau – New Zealand Forest Service to help it understand the current state of the native nursery sector in Aotearoa New Zealand and inform the Native Afforestation Programme and other related workstreams.

More specifically, the survey had **three** objectives:

Identify the current state of the native nursery sector, in order to:

- categorise nurseries by location, size, types of plant supplied, infrastructure and automation capabilities;
- identify nurseries that supply native trees for commercial planting;
- identify nurseries' customers by size, location and plant specifications;
- identify Māori-owned nurseries and specific links to Mātauranga Māori propagation;
- determine stakeholder map and key influencers and shapers of the native nursery sector;
- collect buyer preferences and buyer/seller distribution range.

Identify the challenges faced by the industry, in order to:

- assess nurseries' scalability, including constraints to upscaling (e.g. water availability/space), workforce, overheads, and technology;
- identify technological requirements not currently being met;
- determine current workforce training and related issues.

Identify the support needed by the industry, including to:

- identify organisations linked to the sector with an interest in investing in nurseries or associated activities/products (technologies);
- identify the training environment and future training needs/workforce availability required by the sector;
- identify the science and research requirements of the sector.

Method

The survey was completed as an **online** survey with commercial nurseries listed in a contact database supplied by Te Uru Rākau – New Zealand Forest Service.

This contact database was initially 'cleaned' to remove duplicates, identify nurseries that were no longer operating, and update the contact details for the owner/manager. As a result of this intermediate step, the survey invitation was sent to an original sample of N=479 nurseries on 10 November 2022; 67 percent of whom received a personalised invitation addressed to the owner/manager by name and 33 percent a more generic invitation.

Survey invitations referred to the fact that New Zealand Plant Producers Incorporated (NZPPI) had endorsed the survey. NZPPI also had a feature article about the survey in its Spring Newsletter #2. The survey was also incentivised by offering respondents the opportunity of going into a draw for one of three prizes: a Personal Locator Beacon, a set of 4 -2 way walkie talkies, or an iPhone 13.

Late in November, after monitoring the response closely, we realised that the response to the survey had stalled. This was despite various reminder emails and telephone calls. A significant number of businesses had started the survey but had not completed it.

One of the reasons for this was that some potential respondents did not qualify to complete the survey on the basis that they were, for example, garden centres. When these were identified and removed, the original sample was reduced to N=437.

At the same time, a shorter version of the survey questionnaire was developed with Ministry for Primary Industries' (MPI) approval and input, and this was used to re-launch the survey to non-responding nurseries and those nurseries that had started, but not completed the survey. These nurseries were contacted by our call centre and encouraged to complete this survey either on the telephone or online.

The survey was subsequently closed on 6 December 2022. However, at this stage, Te Uru Rākau – New Zealand Forest Service informed us that 30 nurseries had not been listed in the original contact database.

Consequently, the survey was re-opened on 16 January 2023 and these nurseries were invited to complete the survey. After approximately one week (23 January 2023) and various reminder emails and telephone calls, four of

these additional nurseries had completed the survey.

Table 1 overleaf shows the final response to the survey. This shows that valid responses were received from n=140 nurseries, based on an eligible sample of n=467, resulting in a response rate of 30 percent. If this is calculated on the number of nurseries that were contactable (n=299), the response rate is 47 percent.

Table 1: Survey response

	Total No.
Original “received” sample	674
Original “cleaned” sample (after removing duplicates and closed businesses)	643
Sample invited (after pre-calling those nurseries with phone numbers)	479
Additional 30 nurseries (invited in January 2023)	30
Total eligible sample invited	509
Non-qualifiers (e.g. garden centres)	13
Non-qualifiers (other)	29
True total eligible sample invited	467
Not contactable	168
Contactable, but did not complete survey	159
Completed long interviews	134
Partially completed long interviews (counted)	2
Completed short interviews	4
Completed	140

A profile of the respondents to the survey may be found in Appendix A.

Approach to analysing and reporting the survey results

This report presents the survey results for all respondents (i.e. the total achieved sample of n=140) in terms of two distinct groups:

1. Respondents operating nurseries with **up to and including 5 workers**. We refer to these businesses as “**small**” nurseries and they represent 45 percent of the total sample (n=63).
2. Respondents operating nurseries with **6 or more workers**. We refer to these businesses as “**medium-large**” nurseries and they represent 55 percent of the total sample (n=77).

In turn, the results have also been examined by:

1. Respondents who stated their nursery had **produced and sold native tree seedlings** in their most recent financial year. We refer to these businesses as “**producers**” and they represent 71 percent of the total sample (n=99).

2. Respondents who stated their nursery had **not** produced and sold native tree seedlings in their most recent financial year. We refer to these businesses as “**non-producers**” and they represent 29 percent of the total sample (n=41).

In Section 5.4, which is focused on nurseries’ short-term business plans, the results are presented in terms of those nurseries which plan to “grow” their business (56 percent or n=76), those that plan to ‘stay more or less the same size’ (35 percent or n=48) and those that plan to ‘downsize/close down, etc.’ (8 percent or n=11).

Finally, it is important to note that, although the results for most questions are based on the total sample of n=140, some results are based on a smaller sample size because of the differences between the original and shorter versions of the survey questionnaire. In addition, in some cases, results are based on respondents providing a valid response (i.e. those responding with a ‘don’t know’ have been excluded).

3. CURRENT STATE OF THE NATIVE NURSERY SECTOR

Summary

Current land utilisation:

- The average nursery is utilising **58 percent** of its current available land.
- **4.4 hectares** is the current productive land area of the average nursery.

Current seedling production (all plant types):

- The average nursery is producing seedlings at **63 percent** of its current maximum capacity.
- **690,000** is the current maximum seedling production capacity of the average nursery.

Tree seedling production (in general):

- **81 percent** is the percentage of nurseries producing and selling tree seedlings of all types in their most recent financial year (cf. 78 percent for shrubs and 74 percent for grasses and flax).

Native tree seedling production:

- 71 percent is the percentage of nurseries that produced and sold native tree seedlings in their most recent financial year.
- The mode falls within the **5,001-20,000 band**, reflecting the fact that two-thirds produced and sold up to and including 50,000 seedlings (65 percent); specifically, up to and including 5,000 (35 percent), between 5,001 and 20,000 (16 percent) or between 20,001 and 50,000 (14 percent).
- “medium-large” nurseries produced significantly more; for example, one-third produced 250,000 native tree seedlings or more (33 percent).

Year-on-year comparisons point towards an increase in the production of native tree seedlings:

- 49 percent is the percentage of “current” producers who state they produced and sold **more** native tree seedlings compared with the previous financial year and of these, 57 percent produced 50 percent or more.

Current producers are mostly **private (86 percent), owner-operated (75 percent) businesses**, mostly operating from one site and located in the North of the North Island and the Central Region, with 39 percent distributing nationally. Eight percent identify as Māori businesses.

Actual and potential seedling production

Productive land area

At the beginning of the survey, all respondents were asked to identify their nursery’s **current productive land area**, including as a **percentage of the total available land area**.

Table 2 to Table 3 overleaf presents the results to these questions, with the key findings being as follows:

1. Most respondents stated their nursery’s current productive land area is up to 1 hectare (40 percent) or between 1 and 5 hectares (38 percent). That is, a little over three-quarters of respondents said their nursery had a current productive land area of up to and including 5 hectares (78 percent).

Relatively few respondents stated their nursery has a larger area.

As a result, the **mode falls within the 1–5-hectare band** and the **average productive land area for all respondents is 4.4 hectares**.

2. To an extent, current productive land area varies by nursery size (measured in terms of the number of workers).

Almost all respondents operating “small” nurseries with up to and including 5 workers stated they have a productive land area of up to and including 5 hectares (95 percent). While this was also the case for respondents operating “medium-large” nurseries with 6 or more workers (64 percent), note that 16 percent said they have 16 hectares plus.

Consequently, the average for “small” nurseries is 2.0 hectares and for “medium-large” nurseries it is 6.3 hectares.

3. The extent to which nurseries are currently utilising their available land also varies. Two-thirds of respondents (63 percent) reported utilising 51 percent or more of their available land, while 38 percent reported utilising less than this percentage.

Again, land utilisation rates vary by nursery size, with “medium-large” nurseries tending to have higher rates. Their average percentage is 63 percent, compared with 52 percent for “small” nurseries.

As a result, the mode **falls within the 61-70 percent band** and **current average land utilisation rate for all respondents is 58 percent**.

Table 2: Current total productive area of nursery

	Base =	All respondents 134%	Small 6 %	Medium-large 74%
Up to 1 hectare		40	62	22
1-5 hectares		38	33	42
6-10 hectares		7	2	12
11-15 hectares		4	0	8
16 hectares plus		10	3	16
Total		100	100	100
Average		4.4	2.0	6.3

Total may not sum to 100 percent due to rounding.
Don't knows excluded.

Table 3: Current total productive land area as a percentage of total available land area

	All respondents 127 %	Small 58 %	Medium-large 69 %
Up to and including 10 percent	9	16	3
11-20%	6	5	6
21-30%	7	10	4
31-40%	6	7	4
41-50%	10	9	12
51-60%	9	9	10
61-70%	11	7	14
71-80%	20	19	20
81-90%	9	7	10
91-99%	8	7	9
100%	6	5	7
Total	100	100	100
Average	58 %	52 %	63 %

Total may not sum to 100 percent due to rounding.
Don't knows excluded.



Production capacity

In addition to asking respondents about their nursery's current productive land area, respondents were asked to consider what was their nursery's maximum seedling production capacity. Table 4 presents the results to this question, with the key findings being:

1. Most respondents reported their nursery's maximum seedling production capacity was up to 500,000 per annum (64 percent), although at the other extreme, 15 percent reported their nursery's maximum capacity was over 2 million.
2. The **mode falls into the 50,001-500,000 band**, with an **average maximum seedling production capacity for all respondents of 690,000**.

3. As expected, the mode for "small" nurseries with up to and including 5 workers falls into a lower band 10,001-50,000, with an average maximum seedling production capacity of 160,000.

In comparison, the mode for "medium-large" nurseries with 6 or more workers falls within the 500,001-1,000,000 band, with an average of 1.12 million.

Note that a significant percentage of "medium-large" nurseries have the capacity to produce well beyond this capacity band.

Table 4: Maximum number of seedlings nursery could grow given its current productive area

	Base =	All respondents 123%	Small 55%	Medium-large 68%
Up to and including 5,000		6	11	1
5,001 – 10,000		8	15	3
10,001 – 50,000		17	31	6
50,001 – 500,000		33	38	29
500,001 – 1,000,000		12	5	18
1,000,001 – 2,000,000		9	0	16
2,000,001 +		15	0	26
Total		100	100	100
Average		689,858	158,091	1,119,963

Total may not sum to 100 percent due to rounding.
Don't knows excluded.

Seedling production relative to production capacity

Having identified the average maximum seedling production capacity, respondents were asked to consider their nursery's current production as a percentage of this production capacity.

As a point of reference, respondents were asked to do this in relation to their nursery's most recent financial year. Most identified this as being YE 31 March 2022 (73 percent), with another 11 percent identifying YE 30 June 2022. The remainder (16 percent) identified their most recent financial year as ending across a range of different dates.

Table 5 presents the results to the question, with the key findings being:

1. Most respondents reported their nursery's production in its most recent financial year was 51 percent or more of its production capacity (76 percent). In comparison, 23 percent stated it was lower.
2. As a result, the **average production to capacity rate for all respondents is 63 percent**, with this being higher for "medium-large" nurseries (68 percent) compared with "small" nurseries (57 percent).

Table 5: Seedling production in the most recent financial year as a percentage of production capacity

Base =	All respondents 119%	Small 50%	Medium-large 69%
Up to and including 10%	3	4	3
11-20%	3	2	4
21-30%	6	8	4
31-40%	4	4	4
41-50%	7	8	6
51-60%	12	12	12
61-70%	12	12	12
71-80%	13	8	17
81-90%	19	22	17
91-99%	10	8	12
100%	10	12	9
Total	100	100	100
Average	63%	57%	68%

Total may not sum to 100 percent due to rounding.
Don't knows excluded.

Type of seedlings produced and sold in the most recent financial year

Having identified what respondents considered their nursery's actual production had been in its most recent financial year as a percentage of its production capacity, they were asked to identify **how many seedlings their nursery had produced and sold (if any) of various types of plants** (viz. trees, shrubs, grasses and flaxes, and other types).

Table 6 to Table 7 overleaf presents the results to these questions, with the key findings being:

1. Overall, 81 percent of all respondents stated their nursery had produced and sold **tree seedlings** (of all types) in its most recent financial year. This compares with 78 percent for shrubs and 74 percent for grasses and flax.
In terms of the production of tree seedlings, there is little difference between "small" and "medium-large" nurseries.

2. Almost one-half of all respondents producing and selling **tree seedlings** (47 percent) stated their nursery had produced and sold up to 20,000 seedlings in its most recent financial year. At the other extreme, relatively few had produced and sold 250,001 or more (15 percent).
As a result, the **mode falls within the 20,001-50,000 band** and the **average produced and sold for all respondents is 122,000 tree seedlings**.
3. There is a significant difference between the production of tree seedlings as reported by respondents operating "small" nurseries with up to and including 5 workers compared with those operating "medium-large" nurseries with 6 or more workers. This is evident from the distribution of the results for each; however, we have not calculated averages because the small sample sizes could result in averages that are misleading.

Table 6: Types of seedlings produced and sold in the most recent financial year

	Base =	All respondents 140%	Small 63%	Medium-large 77%
Trees		81	85	77
Shrubs		78	85	72
Grasses and flax		74	80	69
Other		65	66	64
Total		**	**	**

Total may exceed 100 percent because of multiple response.

Table 7: Number of each type of seedling produced and sold in the most recent financial year

	All respondents %	Small %	Medium-large %
Trees:	n=82	n=35	n=47
Up to and including 5,000	34	46	26
5,001 – 20,000	13	23	6
20,001 – 50,000	15	20	11
50,001 – 150,000	15	9	19
150,001 – 250,000	9	3	13
250,001 – 500,000	4	0	6
500,001 +	11	0	19
Total	100	100	100
Average	121,677	NS	NS
Shrubs:	n=79	n=36	n=43
Up to and including 5,000	32	58	9
5,001 – 20,000	16	22	12
20,001 – 50,000	14	14	14
50,001 – 150,000	15	3	26
150,001 – 250,000	10	3	16
250,001 – 500,000	5	0	9
500,001 +	8	0	14
Total	100	100	100
Average	109,620	NS	NS
Grasses and flax:	n=77	n=37	n=40
Up to and including 5,000	27	51	5
5,001 – 20,000	25	32	18
20,001 – 50,000	18	14	22
50,001 – 150,000	14	0	28
150,001 – 250,000	6	3	10
250,001 – 500,000	8	0	15
500,001 +	1	0	2
Total	100	100	100

	All respondents %	Small %	Medium-large %
Average	74,740	NS	NS
Other types:	n=57	n=24 [^]	n=33
Up to and including 5,000	54	75	39
5,001 – 20,000	16	12	18
20,001 – 50,000	18	12	21
50,001 – 150,000	5	0	9
150,001 – 250,000	2	0	3
250,001 – 500,000	2	0	3
500,001 +	4	0	6
Total	100	100	100
Average	46,754	NS	NS

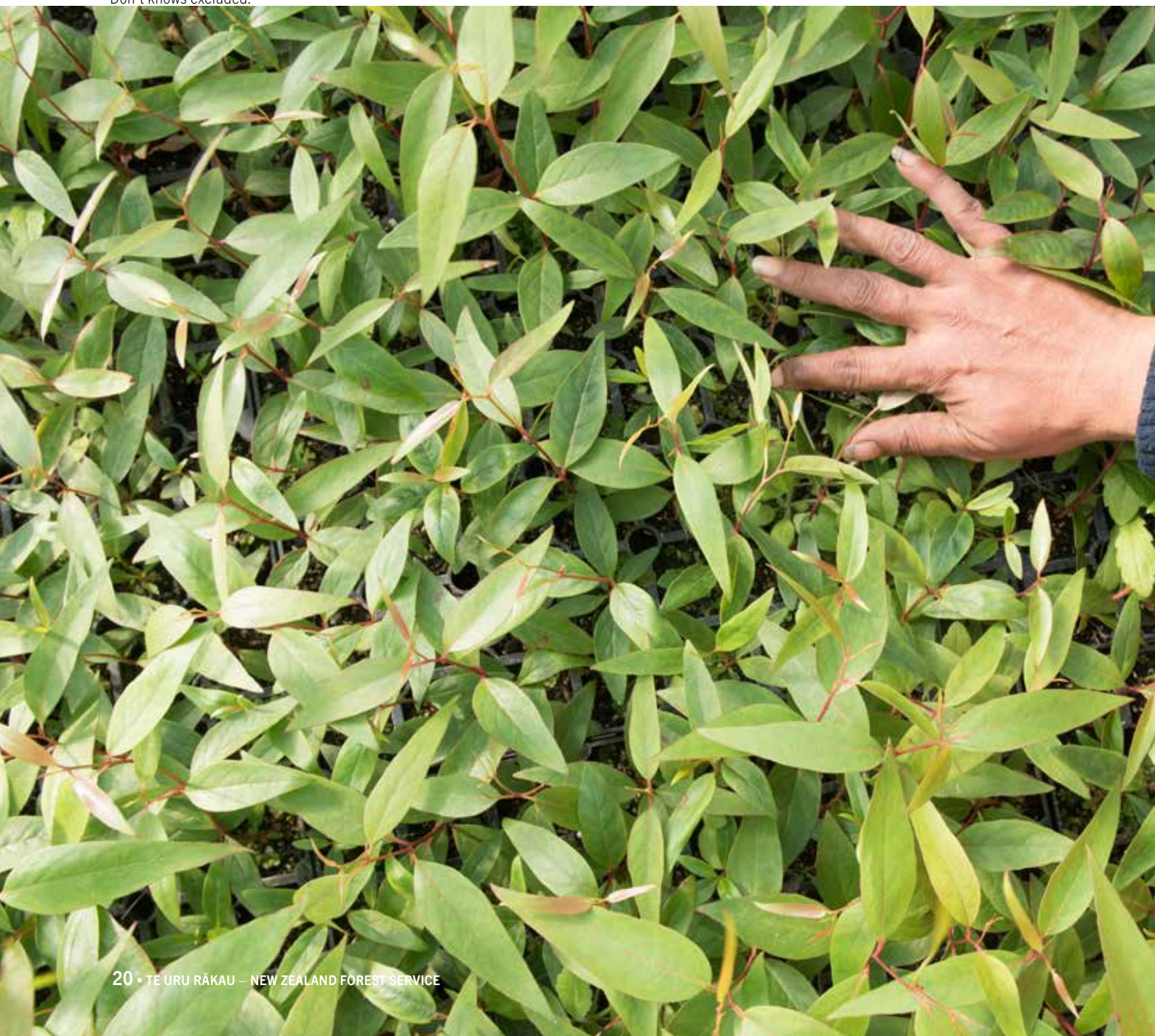
Total may not sum to 100 percent due to rounding.

* Base numbers differ and reflect respondents whose nursery produced and sold each type of plant seedling in its most recent financial year.

[^] Caution: low base number of respondents – results are indicative only.

NS = not specified/calculated.

Don't knows excluded.



Native tree seedling production and sale

Having established respondents' current seedling production in general, the focus was placed on the production of **native tree seedlings**.

Initially, respondents were asked if their nursery had produced and sold native tree seedlings relative to the production and sale of other tree seedling types (viz., non-native, horticultural and other) in their most recent financial year and if they had, the numbers involved.

Table 8 and Table 9 overleaf, presents the results to these questions, with the key findings being:

1. Overall, 88 percent of respondents who stated their nursery had produced and sold tree seedlings in its most recent financial year reported they had produced and sold **native tree seedlings**. This compares with 58 percent for non-natives, 40 percent for horticultural and 37 percent for 'other'.
2. This converts to **71 percent of all nurseries** producing and selling native tree seedlings.
3. Most had produced and sold **relatively small numbers**. Two-thirds stated they had either produced and sold up to 5,000 seedlings (35 percent), between 5,001 and 20,000 (16 percent) or between 20,001 and 50,000 (14 percent).
4. As a result, the **mode for all respondents falls within the 5,001-20,000 band**. We have not calculated an average because the small sample sizes could result in averages that are misleading. However, note the differences in the results as reported by respondents operating "small" and "medium-large" nurseries.

Table 8: Types of tree seedlings produced and sold in the most recent financial year

	Base =	Respondents produced and sold tree seedlings* 110%	Small 52%	Medium-large 58%
Native		88	90	86
Non-native		58	52	64
Horticultural		40	39	40
Other		37	38	36
Total		**	**	**

Total may exceed 100 percent because of multiple response.

* Respondents whose nursery produced and sold tree seedlings in its most recent financial year.

Table 9: Number of types of tree seedlings produced and sold in the most recent financial year

	Respondents produced and sold tree seedlings* %	Small %	Medium-large %
Native trees:	n=74**	n=35	n=39
Up to and including 5,000	35	46	26
5,001 – 20,000	16	29	5
20,001 – 50,000	14	17	10
50,001 – 150,000	14	6	21
150,001 – 250,000	3	0	5
250,001 – 500,000	5	0	10
500,001 +	14	3	23
Total	100	100	100
Average	NS	NS	NS
Non-native trees:	n=44**	n=17^	n=27^
Up to and including 5,000	43	71	26
5,001 – 20,000	20	24	19
20,001 – 50,000	5	0	7
50,001 – 150,000	14	6	19
150,001 – 250,000	2	0	4
250,001 – 500,000	2	0	4
500,001 +	14	0	22
Total	100	100	100
Average	NS	NS	NS
Horticultural trees:	n=11** ^	n=4^	n=7^
Up to and including 5,000	36	25	43
5,001 – 20,000	27	50	14
20,001 – 50,000	18	25	14
50,001 – 150,000	9	0	14
150,001 – 250,000	0	0	0
250,001 – 500,000	0	0	0
500,001 +	9	0	14
Total	100	100	100
Average	NS	NS	NS
Other tree types:	n=6** ^	n=2^	n=4^
Up to and including 5,000	17	0	25
5,001 – 20,000	17	0	25
20,001 – 50,000	0	0	0
50,001 – 150,000	33	100	0
150,001 – 250,000	0	0	0
250,001 – 500,000	0	0	0
500,001 +	33	0	50
Total	100	100	100
Average	NS	NS	NS

Total may not sum to 100 percent due to rounding.

* Respondents whose nursery produced and sold tree seedlings in its most recent financial year.

**Base numbers differ and reflect respondents whose nursery produced and sold each type of tree seedling in its most recent financial year.

^ Caution: low base number of respondents – results are indicative only.

NS = not specified/calculated

Don't knows excluded.

Profile of current native tree seedling producers

As noted in the previous section, 71 percent of all respondents stated their nursery had produced and sold native tree seedlings in its most recent financial year. In this section of the report, we provide a profile of these “producers” (Table 10).

The key findings are as follows:

1. Most respondents whose nursery had produced and sold native tree seedlings in its most recent financial year identified themselves **owners** (75 percent).
2. They described their nursery as a **private business** (86 percent), with either a focus on eco-system restoration (39 percent) or horticulture (30 percent).
3. Almost one-half are **“small” nurseries** with up to and including 5 workers (48 percent). Another 34 percent are **“medium”** sized nurseries, with between 6 and 19 workers. Eighteen percent are **“large”** nurseries, with 20 or more workers.
4. Most are **located in one region**, although one-in-four are located in multiple regions. As a result, almost one-half are located in the North of the North Island (47 percent), compared with the Central Region

(38 percent), the Mid North Island (23 percent) and the South of the South Island (20 percent).

5. Fifty-eight percent **regularly engage** with the sector.
6. Eight percent identified as a **Māori business**.
7. There are relatively few differences between “producers” that are “small” nurseries with up to and including 5 workers and those that are “medium-large” nurseries with 6 or more workers. The main differences are in terms of business focus, location, sector engagement.

Compared with “small” nurseries, “medium-large” nurseries are more likely to be:

- Have a focus on horticulture (38 percent compared with 21 percent for “small” nurseries).
- Be located in Northland (31 percent compared with 19 percent for “small” nurseries), Manawatu-Whanganui (14 percent and 4 percent respectively) and West Coast (20 percent and 11 percent respectively).
- Be more sector engaged (82 percent compared with 49 percent for “small” nurseries).

Table 10: Profile of current producers of native tree seedlings

	Current producer* Base = 97%	Small 47%	Medium-large 50%
Respondent status:			
Owner	75	81	70
General manager	19	11	26
Other	6	9	4
Total	100	100	100
Business status:			
Private business	86	85	86
Not-for-profit business	11	13	10
Local/national government business	3	2	4
Total	100	100	100
Business type:			
Home gardening/Landscaping	19	23	14
Eco-system restoration	39	47	32
Horticulture	30	21	38
Viticulture	0	0	0
Forestry	0	0	0
Other	12	9	16
Total	100	100	100

	Current producer* Base = 97%	Small 47%	Medium-large 50%
Business size:			
A small business (i.e. up to and including 5 workers)	48	100	0
A medium business (i.e. 6-19 workers)	34	0	66
A large business (i.e. 20+ workers)	18	0	34
Don't know	0	0	0
Total	100	100	100
Business location:			
Northland (Te Tai Tokerau)	25	19	31
Auckland (Tāmaki Makau Rau)	16	17	14
Waikato (Waikato)	6	4	8
Bay of Plenty (Te Moana a Toi)	3	0	6
Gisborne (Turanganui-a-Kiwa)	6	4	8
Hawke's Bay (Heretaunga)	7	9	6
Taranaki (Taranaki)	7	6	8
Manawatu-Whanganui (Manawatu-Whanganui)	9	4	14
Wellington-Wairarapa (Te Whanganui-a-Tara/ Wairarapa)	5	4	6
Tasman (Te Taihu)	2	0	4
Nelson (Te Taihu)	4	4	4
Marlborough (Te Taihu)	2	2	2
West Coast (Te Tai Poutini)	16	11	20
Canterbury (Waitaha)	6	6	6
Otago (Otago)	3	2	4
Southland (Murihiku)	11	13	10
Total	**	**	**
Sector engagement (i.e. regularly have contact with):			
No contact with any	34	51	18
IPPS	30	17	43
NZ Forest Service	3	0	6
NZPPI	57	36	78
Don't know	8	11	6
Total	**	**	**
Identify as a Māori business:			
Yes	8	6	10
No	90	91	88
Don't know	2	2	2
Total	100	100	100

* Respondents whose nursery produced and sold native tree seedlings in its most recent financial year.

** Total may exceed 100 percent because of multiple response.

Current production and sale of native tree seedlings compared with previous financial year

All respondents, regardless of whether or not their nursery had produced and sold native tree seedlings in its most recent financial year, were asked how this compared with the previous financial year. Table 11 provides the results of this comparison, with the key findings being:

1. Overall, 49 percent of all respondents who stated their nursery had produced and sold native tree seedlings

in its most recent financial year said their nursery had produced and sold **more** native tree seedlings compared with the previous financial year.

While another 36 percent said they had produced and sold the **same** number, significantly fewer stated their nursery had produced less (7 percent) or no native tree seedlings (3 percent).

Table 11: Comparison of the production and sale of native tree seedlings in the most recent financial year with previous financial year

	Base = All respondents 140%	Current producer* 97%	Current non-producer 43%
No native trees produced the year before the last financial year	15	3	42
More	38	49	12
About the same	33	36	26
Less	6	7	2
Don't know	9	4	19
Total	100	100	100

Total may exceed 100 percent because of multiple response.

* Respondents whose nursery produced and sold native tree seedlings in its most recent financial year.

Respondents who reported their nursery had produced and sold more or less, were asked for an indication of the percentage difference. Table 12 overleaf presents the results to this question. This shows that one-third of respondents producing and selling **more** (37 percent), had increased their production by 51 percent or more. The number of respondents producing less is too small to base any conclusions with confidence.

Table 12: Percentage difference between the production and sale of native tree seedlings in the most recent financial year compared with previous financial year

	Base =	Respondents producing more* 48%	Respondents producing less** 7^%
Up to an including 10%		12	14
11-20%		12	29
21-30%		35	43
31-40%		0	0
41-50%		2	14
51-75%		10	0
76-100%		12	0
Don't know		15	0
Total		100	100
Average		NS	NS

Total may exceed 100 percent because of multiple response.

* Respondents whose nursery produced and sold **more** native tree seedlings in its most recent financial year compared with the previous financial year.

** Respondents whose nursery produced and sold **less** native tree seedlings in its most recent financial year compared with the previous financial year.

^ NS = not specified/calculated



The types and locations of current producers' markets

Towards the end of the survey, all respondents were asked to identify who their customers were and where they were located relative to their operation. While these questions were asked in general and not specifically in relation to the production and sale of native tree seedlings, it is reasonable to assume that there is a positive correlation between the two.

Table 13 and Table 14 overleaf present the results to these questions, with the key findings being:

1. Landscaping/Gardening businesses (71 percent), farmers (66 percent) and councils and local government (65 percent) were most frequently identified by respondents who stated their nursery had

produced and sold native tree seedlings in its most recent financial year as their customers.

This is not necessarily reflective of volumes sold and with this in mind, 42 percent sold to catchment groups, 15 percent to forestry companies and 10 percent to central government, with this being the case for "medium-large" nurseries in particular.

2. While "producers" of tree seedlings most frequently stated their customers were located in the same region as they were (69 percent) and in regions close by (52 percent), 39 percent said that their customers were located across the country. "medium-large" nurseries were more likely than "small" nurseries to state this was the case.

Table 13: Types of customers

	All respondents 138 Base = %	Current producer* 96 %	Small 47 %	Medium-large 49 %
Landscaping/Gardening businesses	62	71	66	76
Farmers	54	66	64	67
Councils and local government	53	65	53	76
Catchment groups	34	42	36	47
Forestry companies	15	15	2	27
Central government	8	10	4	16
Others	46	41	36	45
Total	**	**	**	**

Total may exceed 100 percent because of multiple response.

* Respondents whose nursery sold to plant native tree seedlings in its most recent financial year.

Table 14: Location of customers

	All respondents 138 Base = %	Current producer* 96 %	Small 47 %	Medium-large 49 %
The region(s) your business is mainly located in	57	69	74	63
Regions close by	41	52	55	49
Nationally	50	39	30	47
Internationally	2	1	0	2
Don't know	1	1	2	0
Total	**	**	**	**

Total may exceed 100 percent because of multiple response.

* Respondents whose nursery sold to plant native tree seedlings in its most recent financial year.

Respondents were also asked to identify the furthest area their business sent seedlings to and the results to this question are presented in Table 15 overleaf, cross-tabulated by the region the nursery is located in (i.e. North of the North Island, Mid North Island, Central and South of the South Island). This shows that location is no obstacle to distribution. For example, 38 percent of respondents whose nursery was located in the North of the North Island shipped their seedlings to customers as far away as in Southland.

Table 15: Furthest area business sends seedlings to

	All Base = respondents 138 %	Current producer* 96 %	North North Island 57 %	Mid North Island 26 %	Central 34 %	South South Island 29 %
Northland (Te Tai Tokerau)	14	14	4	9	34	14
Auckland (Tāmaki Makau Rau)	14	26	0	3	14	26
Waikato (Waikato)	4	7	4	3	0	7
Bay of Plenty (Te Moana a Toi)	1	4	0	0	0	4
Gisborne (Turanganui-a-Kiwa)	1	2	0	0	0	2
Hawke’s Bay (Heretaunga)	4	2	15	3	0	2
Taranaki (Taranaki)	4	2	12	3	0	2
Manawatu-Whanganui (Manawatu-Whanganui)	2	2	0	6	0	2
Wellington-Wairarapa (Te Whanganui-a-Tara/Wairarapa)	7	0	8	18	3	0
Tasman (Te Taihū)	0	0	0	0	0	0
Nelson (Te Taihū)	2	0	0	6	3	0
Marlborough (Te Taihū)	1	0	0	6	3	0
West Coast (Te Tai Poutini)	3	4	0	6	0	4
Canterbury (Waitaha)	10	7	8	9	17	7
Otago (Otago)	8	4	12	9	10	4
Southland (Murihiku)	24	28	38	21	14	28
Total	100	100	100	100	100	100

Total may not sum to 100 percent due to rounding.

* Respondents whose nursery produced and sold native tree seedlings in its most recent financial year.

Demand for eco-seeds

Respondents were asked about the demand for ‘eco-seeds’. These were described to them as follows: ‘... seeds which are collected close to where seedlings are then planted’. Table 16 shows almost two-thirds of all respondents (62 percent) stated there is a positive demand for eco-seeds, with over one-third (36 percent) giving the best possible answer of ‘a very high level of demand’.

The table also shows current “producers” reporting a higher level of demand for eco-seeds (69 percent), with this being the case for those operating “medium-large” nurseries in particular (78 percent).

Table 16: The demand for eco-seeds

	All respondents Base = 136 %	Current producer* 97 %	Small 47 %	Medium- large 50 %
A very low level of demand	7	6	9	4
Not much of a demand	10	9	17	2
Neither a high nor low level of demand	8	10	9	12
Somewhat of a demand	26	33	28	38
A very high level of demand	36	36	32	40
Don't know	13	5	6	4
Total	100	100	100	100

Total may exceed 100 percent because of multiple response.

* Respondents whose nursery sold to plant native tree seedlings in its most recent financial year.

4. FUTURE PRODUCTION INTENTIONS

Summary

Increasing native tree production:

- **69 percent** is the percentage of nurseries (both current “producers” and “non-producers”) that expressed a **positive level of interest** in either producing more or starting to produce native tree seedlings.
- This was especially the case amongst **current “producers”**; two-thirds of whom gave the best possible answer when asked if they would consider producing more native tree seedlings (i.e. ‘would **seriously** consider producing and selling more’).

Reasons for not increasing production:

- **Three main reasons** were provided by nurseries **not interested** in increasing production or starting to produce native tree seedlings:
- An unwillingness to change/happy producing what they are producing (81 percent of these respondents gave this as a reason).
- Lack of capital (36 percent).
- Lack of infrastructure (33 percent).



Likely future production and sale of native tree seedlings

All respondents were asked whether they would be **interested in producing and selling (more or starting to produce) native tree seedlings**. Table 17 (for current “producers” of native tree seedlings) and Table 18 (for current “non-producers” of native tree seedlings), both overleaf, present the results to this question, with the key findings being as follows:

1. Two-thirds of **current “producers”** of native tree seedlings (68 percent) gave the best possible answer when asked if they would consider producing **more** native tree seedlings (i.e. ‘would **seriously** consider producing and selling more’).
2. Another 9 percent said they would consider doing so, although not as strongly, meaning that nearly three-

quarters of current “producers” in total (77 percent) expressed an interest in growing more seedlings.

3. A positive response was also recorded by **current “non-producers”**, with almost one-half (48 percent) expressing an interest in starting to produce and sell native tree seedlings.
4. These results reflect the earlier year-on-year comparisons reported in Section 3.4, which point to an increase in the production of native tree seedlings.
5. Levels of interest differ by business size, particularly in terms of current “non-producers”, but caution should be exercised given the small sample sizes. However, when the results for “producers” and “non-producers” are combined, 69 percent of all respondents expressed a positive level of interest in either producing more or starting to produce native tree seedlings.

Table 17: Interest in producing and selling more native tree seedlings – Current producers

	Current producer*	Small	Medium-large
Base =	76 %	37 %	39 %
Would not consider at all (1)	3	5	0
2	5	8	3
3	13	14	13
4	9	8	10
Would seriously consider	68	62	74
Don't know	1	3	0
Total	100	100	100

Total may not sum to 100 percent due to rounding.

* Respondents whose nursery produced and sold to plant native tree seedlings in its most recent financial year

Table 18: Interest in starting to produce and sell native tree seedlings – Current non-producers

	Current Non-producer*	Small	Medium-large
Base =	33 %	12** %	21** %
Would not consider at all (1)	24	25	24
2	3	0	5
3	18	17	19
4	3	0	5
Would seriously consider	45	58	38
Don't know	6	0	10
Total	100	100	100

Total may not sum to 100 percent due to rounding.

* Respondents whose nursery did **not** produce and sell plant native tree seedlings in its most recent financial year

**Caution: low base number of respondents – results are indicative only.

Profile of future “producers” (in comparison to current “producers”)

Table 19 overleaf presents a profile of future “producers” of native tree seedlings in comparison to the profile of current producers.

Future “producers” are defined as all current “producers”, **plus** current “non-producers” nurseries that indicated they would be interested in starting to produce and sell native tree seedlings (i.e. responded with a 4 or 5 rating when asked if they would consider starting).

Given the assumption that current “producers” will continue to produce native tree seedlings (about three-quarters of whom are in fact interested in increasing production compared with about one-half of current “non-producers” who are interested in starting production), the profile of future “producers” is more or less the same as that presented in Section 3.3.

Table 19: Profile of future producers of native tree seedlings (in comparison to current producers)

	Current producer*	Future producer^	Small	Medium-large
	97	113	54	59
Base =	%	%	%	%
Respondent status:				
Owner	75	74	78	71
General manager	19	19	13	25
Other	6	6	9	3
Total	100	100	100	100
Business status:				
Private business	86	87	85	88
Not-for-profit business	11	11	13	8
Local/national government business	3	3	2	3
Total	100	100	100	100
Business type:				
Home gardening/Landscaping	19	18	24	12
Eco-system restoration	39	35	44	27
Horticulture	30	31	24	37
Viticulture	0	1	0	2
Forestry	0	2	0	3
Other	12	13	7	19
Total	100	100	100	100
Business size:				
A small business (i.e. up to and including 5 workers)	48	48	100	0
A medium business (i.e. 6-19 workers)	34	34	0	64
A large business (i.e. 20+ workers)	18	19	0	36
Don't know	0	0	0	0
Total	100	100	100	100
Identify as a Māori business:				
Yes	8	11	6	15
No	90	88	93	83
Don't know	2	2	2	2
Total	100	100	100	100

	Current producer*	Future producer^	Small	Medium-large
Base =	97 %	113 %	54 %	59 %
Business location:				
Northland (Te Tai Tokerau)	11	13	13	12
Auckland (Tāmaki Makau Rau)	25	25	21	29
Waikato (Waikato)	16	14	15	12
Bay of Plenty (Te Moana a Toi)	6	8	6	10
Gisborne (Turanganui-a-Kiwa)	3	4	0	7
Hawke's Bay (Heretaunga)	6	5	4	7
Taranaki (Taranaki)	7	6	8	5
Manawatu-Whanganui (Manawatu-Whanganui)	7	6	6	7
Wellington-Wairarapa (Te Whanganui-a-Tara/ Wairarapa)	9	8	4	12
Tasman (Te Taihū)	5	5	4	5
Nelson (Te Taihū)	2	2	0	3
Marlborough (Te Taihū)	4	4	4	3
West Coast (Te Tai Poutini)	2	3	4	2
Canterbury (Waitaha)	16	16	11	21
Otago (Otago)	6	5	6	5
Southland (Murihiku)	3	3	2	3
Total	**	**	**	**

** Total may not sum to 100 percent due to rounding.

* Respondents whose nursery produced and sold native tree seedlings in its most recent financial year.

^ Includes current producers and those current non-producers who indicated they would be interested in starting to grow and sell (gave a 4 or 5 rating on the Likert scale).

Constraints and limitations impacting future production

In Section 4.1, 21 percent of current “producers” of native tree seedlings indicated they would **not** consider increasing their production (n=20) and 45 percent of current “non-producers” stated they would **not** consider starting production (n=15).

These respondents were asked to provide an explanation. We have examined their verbatim response and have identified the following major themes:

1. Physical constraints such as limited land area and water supply.
2. Other constraints such as limited time and (skilled) labour.
3. Seed sourcing, as expressed in the following verbatim:
 - *There isn't a commercially friendly framework for eco-sourcing seed. We support the intent behind eco-sourcing, but do not have the skills or time to do it ourselves. We are often asked for eco-sourced plants but have found that purchasers are not willing to pay more for the additional effort to source seed, and when unavailable, they will often end up buying non-eco-sourced plants anyway. We have tried but been unable to find suppliers of eco-sourced seed that we can purchase from, or contractors that will eco-source seed for us.*
4. A perceived lack of demand (or an uncertain level of demand), as perceived in the following verbatim:
 - *Supply and demand for native tree seedlings is chicken and egg. A nursery must be prudent and careful not to get ahead of anticipated demand. But an afforestation project may need 100,000 seedlings, or more. So, no nursery can take the risk, given a typical 5-year production cycle, of preparing that quantity so they can be sitting waiting at the point they are needed. Production of Afforestation seedlings need a completely different approach with some funding available in order to gear up to meet potential or govt sponsored afforestation demand.*
5. Relatedly, a concern about the likely return-on-investment, as expressed in the following verbatim:
 - *We can command a much better price, and have a healthier margin, for trees that are more advanced and better cared for (trimmed, staked etc.) for the retail and landscape markets. We want to be a better employer and produce quality plants, we're concerned that the market for native seedlings is a 'race to the bottom'.*
 - *The market is crowded, [and native tree seedlings are a] low price per unit.*

- *[It's] not core business and not enough margin to justify the investment and complexity required to do it in scale.*
6. A perception of an uneven playing field, as expressed in the following verbatim:
 - *One other huge barrier currently appears to be the separatist attitude to growing native plants and trees. Māori nurseries receive huge grants to get established and then get further grants to expand. Whereas non-Māori nurseries such as ours need to sink or swim with no financial help whatsoever. We are not asking for financial help; we are asking for a fair playing field where the colour of skin or the origin of your family name doesn't determine a handout or hand-up. If government wants to support the growth of native nurseries make sure all those in the industry are treated fairly.*

A more structured question was also asked of these respondents, whereby a number of potential reasons were presented to them and they were asked to rate their relevance using a 5-point Likert scale. The key findings are as follows (Table 20):

1. Overall and reflecting the earlier responses, **three** barriers were most frequently mentioned, namely
 - Happy producing what they are producing (81 percent of respondents gave this as a reason).
 - Lack of capital (36 percent).
 - Lack of infrastructure (33 percent).
2. Although mentioned to a lesser extent, it is interesting that only 14 percent of respondents identified a ‘lack of demand’ as a barrier to native tree seedling production.
3. In addition, it is interesting to note what other reasons were mentioned less frequently as a reason; namely:
 - Lack of technology (19 percent of respondents gave this as a reason).
 - Lack of available land (17 percent). Note that the average land utilisation rate for all respondents is 53 percent (refer to Section 3.0).

Table 20: Barriers to the production of native tree seedlings

	Respondents not prepared to produce more/start to produce*
Base =	36 %
We are happy producing what we are producing:	
Not a reason (1-2)	6
Neutral (3)	6
A reason	81
Don't know	8
Total	100
We don't have the capital to make the investment required:	
Not a reason (1-2)	47
Neutral (3)	11
A reason	36
Don't know	6
Total	100
We don't have the infrastructure:	
Not a reason (1-2)	44
Neutral (3)	17
A reason	33
Don't know	6
Total	100
We don't have the time:	
Not a reason (1-2)	25
Neutral (3)	19
A reason	50
Don't know	6
Total	100
We don't have enough water:	
Not a reason (1-2)	61
Neutral (3)	6
A reason	28
Don't know	6
Total	100
Lack of demand:	
Not a reason (1-2)	61
Neutral (3)	17
A reason	14
Don't know	8
Total	100
We don't have enough available land:	
Not a reason (1-2)	72
Neutral (3)	6
A reason	17
Don't know	6
Total	100
We don't have the technology:	
Not a reason (1-2)	69
Neutral (3)	6
A reason	19
Don't know	6
Total	100

Total may not sum to 100 percent due to rounding.

* Respondents who would not consider growing more/starting to grow native tree seedlings.

5. PRODUCTION ENABLERS AND INHIBITORS

Summary

Workforce numbers and skill set:

- **40 percent is the percentage of nurseries currently wanting more workers** – this demand for workers is particularly seen amongst “medium-large” nurseries. Over one-half of respondents operating “medium-large” nurseries (57 percent) stated their nursery planned to employ more workers this coming financial year compared with 18 percent of those operating “small” nurseries.
- **37 percent is the percentage of nurseries that have experienced recruitment difficulties** in their most recent financial year, with this more frequently mentioned by “medium-large” nurseries (47 percent compared with 25 percent for “small” nurseries).
- Respondents identified **skills shortages at all levels**, including management and sales. While most of the current workforce has NZQA-level qualifications, these tend to be at Levels 1-3. Furthermore, most respondents (53 percent) reported their nursery had 30 percent or less of its NZQA-qualified workers with agricultural, horticultural or nursery production qualifications.
- While most respondents stated they **had training practices** in place during their most recent financial year, aside from on-the-job training (72 percent), relatively few reported these were formal practices (e.g. 16 percent reported they had training in place for the NZ Certificate of Horticulture and 5 percent stated they had training for the NZ Certificate in Primary Industry Skills).

Technology:

- **67 percent is the percentage of nurseries that currently use at least one of a number of the technologies covered by the survey** – the best results were in terms of electronic inventory systems (41 percent) and environmental monitoring (37 percent).
- **Usage is greatest amongst “medium-large” nurseries** (90 percent) compared with “small” nurseries (40 percent).
- When respondents were asked what technologies they would **most prefer** if they helped to increase their production/performance, about one-half or more of “medium-large” nurseries showed a particular interest in electronic inventory systems, automated potting and environmental monitoring.
- In comparison, 16 percent of respondents operating “small” nurseries categorically stated they were **not** interested in any. To put this into context, 59 percent of these nurseries reported they were not currently using any of the technologies.

Research and development:

- **28 percent is the percentage of nurseries that have undertaken/funded R&D** in their most recent financial year.
- Seed supply and storage, as it relates to native tree production, was identified by respondents as the subject area that should be researched **first** – overall, this was identified by 28 percent of all respondents, followed by germination rates at 14 percent.

Business development:

- **56 percent is the percentage of nurseries wanting to “grow” their business** – respondents operating “medium-large” nurseries were almost twice as likely as those operating “small” nurseries to state they intended to develop their business (71 percent and 38 percent respectively).
- **80 percent is the percentage of those nurseries wanting to “grow” that have made changes to the way they operate** in their most recent financial year, in support of their development plans.

- **A raft of changes has been made by nurseries wanting to “grow” their business** – including increasing their productive land area (67 percent), building new infrastructure such as buildings (63 percent), changing propagation practices (59 percent), changing business practices (56 percent), increasing machinery use (53 percent), and/or increasing the use of technology (49 percent).

Capital investment:

- **85 percent is the percentage of nurseries wanting to “grow” that have invested capital** to make changes to their business – over one-half (52 percent) invested \$100,001 or more in their most recent financial year, resulting in a mode within the \$100,000-500,000 band and an average of \$360,000.

Changes not made:

- **79 percent is the percentage of nurseries wanting to “grow” their businesses that wanted to make (other) changes to their nursery but did not** – these include increasing the use of technology (45 percent), increasing productive land area (42 percent), building new infrastructure such as buildings (42 percent), employing more staff (39 percent) and increasing machinery use (37 percent).
- **49 percent is the percentage of these nurseries that mentioned a lack of capital as the most important reason for not making (other) changes** – overall, this was mentioned by 65 percent of these respondents as a reason, with others including a lack of time (50 percent), a lack of skilled staff (37 percent) and not having the right infrastructure (33 percent).

Workforce

In Section 4.3, we presented the reasons provided by current producers of native tree seedlings who would **not** consider increasing their production and current non-producers who would not consider starting production. On an unprompted basis, a lack of labour was provided as a reason by some of these respondents. In this sub-section and those following, we examine nurseries’ workforce situation in greater detail.

Workforce numbers

Respondents were asked to indicate the numbers of workers of various types (viz. full-time, part-time, fixed-term and volunteers) their nursery had employed in its most recent financial year.

Table 21 overleaf, presents the results to this question, with the key findings being:

1. Most respondents stated their nursery had employed full-time workers (89 percent employed at least one full-time worker) or part-time workers (79 percent employed at least one part-time worker), while relatively few stated their nursery had employed fixed-term or volunteers.
2. As expected, respondents operating “medium-large” nurseries stated their nursery had employed significantly greater numbers of both full-time and part-time workers, compared with those operating “small” nurseries.

Table 21: Worker numbers – Most recent financial year

	All respondents	Small	Medium-large
Base =	136	61	75
	%	%	%
Full-time workers (work 30 hours or more/week):			
None	11	23	1
1-5	46	74	23
6-10	15	3	25
11-20	12	0	21
21 or more	16	0	29
Total	100	100	100
Part-time workers (work 30 hours or more/week):			
None	21	33	12
1-5	62	64	60
6-10	9	3	13
11-20	3	0	5
21 or more	4	0	8
Total	100	100	100
Fixed-term workers (including seasonal):			
None	69	92	51
1-5	19	8	28
6-10	4	0	7
11-20	1	0	1
21 or more	5	0	9
Total	100	100	100
Volunteers:			
None	84	84	84
1-5	9	8	9
6-10	1	2	0
11-20	2	3	1
21 or more	2	3	1
Total	100	100	100

Total may not sum to 100 percent due to rounding.

Respondents were also asked to indicate what percentage of their workers in their most recent financial year were New Zealanders and what percentage comprised people from other countries. Table 22 presents the results to this question, with the key findings being:

1. The large majority of respondents reported between 76-100 percent of their nursery's workforce had been comprised New Zealanders.
2. In comparison, 64 percent of respondents stated that they had no overseas workers, with most reporting that if their nursery had had overseas workers, they comprised up to 20 percent of their workforce at best.

Table 22: Worker origins

	Base =	All respondents 136 %	Small 61 %	Medium-large 75 %
New Zealanders:				
None		2	5	0
Up to and including 10%		0	0	0
11-20%		0	0	0
21-30%		2	0	4
31-40%		2	2	3
41-50%		4	3	4
51-75%		4	2	5
76-100%		82	87	77
Don't know		4	2	7
Total		100	100	100
People from other countries:				
None		64	82	49
Up to and including 10%		10	7	12
11-20%		9	0	16
21-30%		4	2	5
31-40%		0	0	0
41-50%		4	3	4
51-75%		4	2	7
76-100%		1	3	0
Don't know		4	2	7
Total		100	100	100

Total may not sum to 100 percent due to rounding.

Respondents were asked to compare their worker numbers in their most recent financial year with their worker numbers in the financial year before that, and to comment on what their intentions were for the coming financial year. Table 23 presents the results to these questions, with the key findings being:

1. Overall, respondents stated the number of workers their nursery had employed in its most recent financial year was either the **same** as the previous financial year (66 percent) and **would be the same** in the coming financial year (54 percent). However, it is notable that, for some nurseries, worker numbers have been and will continue to **grow**. For example, 40 percent of respondents stated the

number of workers in the coming financial year would be **more** than in the most recent financial year. In comparison, very few stated their nursery would employ fewer workers (4 percent).

2. Of note is the fact that this growth in workforce numbers is most likely to be seen amongst “medium-large” nurseries. For example, 57 percent of respondents operating “medium-large” nurseries stated their nursery intended to employ more workers this coming financial year compared with those operating “small” nurseries (18 percent).

Table 23: Worker numbers – Most recent financial year compared with previous and coming financial year

	All respondents	Small	Medium-large
Base =	136	61	75
	%	%	%
In comparison to <u>previous</u> financial year:			
More	21	8	31
About the same	66	79	56
Fewer	10	10	11
Don't know	3	3	3
Total	100	100	100
In comparison to <u>coming</u> financial year:			
More	40	18	57
About the same	54	75	36
Fewer	4	5	4
Don't know	2	2	3
Total	100	100	100

Total may not sum to 100 percent due to rounding.

Recruitment issues

With regard to the fact that many respondents reported their nursery's intention to employ more workers this coming financial year (and particularly those operating "medium-large" nurseries), respondents were asked if they had experienced any difficulties recruiting workers in their most recent financial year.

Table 24 shows the results to this question, with the key findings being:

1. More than one-third of respondents stated they had **experienced difficulties** (37 percent).
2. This was particularly the case with respondents operating "medium-large" nurseries in comparison with those operating "small" nurseries (47 percent and 25 percent respectively).

Table 24: Difficulties recruiting workers most recent financial year

	All respondents	Small	Medium-large
Base =	136	61	75
	%	%	%
Yes	37	25	47
No	44	39	48
Not applicable (i.e. did not recruit)	18	36	4
Don't know	1	0	1
Total	100	100	100

Total may not sum to 100 percent due to rounding.

Respondents were also asked to comment on what skill shortages their industry was experiencing, in general, and why.

Some respondents specifically commented on the skill shortages faced by the industry in terms of there being a lack of skills and experience at all levels, including management and sales.

- *All skills associated with a native tree nursery: seed collection, nursery production, growing techniques, plant identification, handling skills, sales and customer service.*
- *Lack of nursery experience, plant knowledge, use of agri-chemicals and machinery skills, i.e. driving trucks, forklifts and tractors.*

However, most took the opportunity to comment about the work ethic of the workforce, which they saw was 'propped up' by the Government:

Ability to put in a full day's work, ability to turn up every day and a willingness to work (if these are judged as skills).

- *Where do I start? Our education system is an abject failure in our region. Most school leavers are functionally illiterate, do not have a driver's license and come from inter-generational welfare dependency. The current government's social welfare settings encourage fixed term staff to stop work as soon as they hit the threshold where they start to lose 'top up' benefits. The higher the hourly rate, the fewer the hours staff are motivated to work. MSD tops staff up if work is stopped due to weather, and they allow workers who decide they don't want to work to go straight back onto benefits. We have been in business for 40 years and have NEVER had these sorts of issues before. If I hear the Government tell us that we just need to pay more, I will scream. We pay \$23/hr if you walk in off the street with no experience. ... we pay full hourly rates if they have to travel off site or their worksite is more than 5 k's out of town (in which case we transport them as well). The ptech's put out too many students who don't actually want to be there – just go to poly so they can keep their benefits. The university system has failed hort./plant production terribly – what was once an outstanding system... I won't go on – suffice to say we despair at where our country is headed, based on our experiences over time.*
- *At ALL levels there is a very real labour crisis in NZ. Despite the fact there are 1,800 'work ready' Job Seekers in our region (xxx), basic skills like 'turn up to work 5 days/week', listen to instructions and please follow them, care about your work, it is really important to us, care about quality, please try and give an honest day's work for an honest day's pay, look at others*

around you earning \$50/hr on piece rates and why not try and do the same?!! As for horticultural skills, non-existent, unless they have come across from another hort. company.

Notwithstanding that some respondents blamed the work ethic of the young generation, etc. and others the COVID-19 pandemic for the 'labour crisis', others referred to the fact that there was no specific training in what is a fairly specialised industry.

- *Lack of tertiary and training courses available (this has currently started changing), but Primary ITO is not nursery specific. It's more geared toward orchard/fruit/vegetable production.*
- *There is a low unemployment rate in New Zealand. Furthermore, if I was a school leaver and knew I would be earning \$80,000-\$100,000 working in Horticulture versus \$200,000 as a Civil Engineer I would lean that way. And now Te Uru Rakau is trying to water down the industry even more going for cheap plants and cheap knowledge.*
- *It's a fledgling industry, it's growing so there's more demand for the skills than the skills that are available. It's a very specialized industry as well so it's very difficult to find the training. A lot of the knowledge is proprietary and people like myself are not really willing to go train anyone else, my competitors for example.*

Still others referred to the fact that the 'labour crisis' was, in part, because the industry did not self-promote itself.

- *We're not seen as an appealing industry to enter, as the bulk of jobs are considered unskilled labour. History of mediocre pay rates even at senior levels. Not well advertised to the public as a critical job considering our export market being a huge percent of primary product. Very poor exposure to hort. subjects in the NZ school system.*

Qualifications

With respect to the skill base of the sector, respondents were asked to what extent the employees who worked for them in their most recent financial year had NZQA-level qualifications. Table 25 shows the results to this question, with the key findings being:

1. Most stated they had workers **with** NZQA qualifications (72 percent).
2. This was more frequently confirmed by respondents operating "medium-large" nurseries compared with those operating "small" nurseries (86 percent and 56 percent respectively).

Table 25: Extent to which workers (in the most recent financial year) had NZQA-level qualifications

	All respondents 140 Base = %	Small 63 %	Medium-large 77 %
Yes	72	56	86
No	18	32	6
Don't know	10	13	8
Total	100	100	100

Total may not sum to 100 percent due to rounding.

Table 26 overleaf shows what percentage of their workers had NZQA qualifications at each level:

1. This shows nurseries employing a range of workers in terms of their NZQA qualification level; for example, 63 percent have workers with at least NZQA Level 1-3, 56 percent with Level 4, 43 percent with Level 5-6 and

46 percent with Level 7 plus.

2. However, the percentages of workers at each level point towards most workers having only Level 1-3 qualifications.

3. This varies little by nursery size in terms of the number of workers.

Table 26: Percentage of workers at each NZQA-level qualification

	Respondents with NZQA qualified workers* 98 Base = %	Small 33 %	Medium-large 65 %
NZQA Level 1-3 (high school):			
None	37	42	34
Up to and including 10%	9	21	3
11-20%	7	3	9
21-30%	5	0	8
31-40%	5	6	5
41-50%	5	3	6
51-75%	19	12	23
76-100%	12	12	12
Don't know	0	0	0
Total	100	100	100
NZQA Level 4 (certificate):			
None		61	35
Up to and including 10%	20	15	23
11-20%	7	6	8
21-30%	6	0	9
31-40%	6	9	5
41-50%	10	0	15
51-75%	2	3	2
76-100%	4	6	3
Don't know	0	0	0
Total	100	100	100
NZQA Level 5-6 (diploma):			
None	56	55	57
Up to and including 10%	24	21	26
11-20%	4	3	5
21-30%	7	3	9
31-40%	3	6	2
41-50%	1	3	0

	Respondents with NZQA qualified workers*	Small	Medium-large
Base =	98 %	33 %	65 %
51-75%	2	3	2
76-100%	1	3	0
Don't know	1	3	0
Total	100	100	100
NZQA Level 7 or above (bachelor's degree or higher):			
None	53	52	54
Up to and including 10%	16	9	20
11-20%	13	9	15
21-30%	5	3	6
31-40%	5	9	3
41-50%	0	0	0
51-75%	3	9	0
76-100%	3	6	2
Don't know	1	3	0
Total	100	100	100

Total may not sum to 100 percent due to rounding.

* Respondents with workers who have NZQA qualifications.

In addition to NZQA-level qualifications, respondents with NZQA-qualified workers were also asked to what extent their workers had qualifications specifically in agriculture, horticulture or nursery production (Table 27):

1. This shows that most respondents reported their nursery had 30 percent or less of its NZQA-qualified workers with these qualifications (53 percent).
2. Respondents operating “medium-large” nurseries were more likely to report this than those operating “small” nurseries (57 percent and 46 percent respectively).

Table 27: Percentage of workers with qualifications in agriculture, horticulture or nursery production

	Respondents with NZQA qualified workers *	Small	Medium-large
Base =	101 %	35 %	66 %
Up to an including 10%	21	23	20
11-20%	12	9	14
21-30%	20	14	23
31-40%	9	11	8
41-50%	7	3	9
51-75%	10	11	9
76-100%	15	20	12
Don't know	7	9	6
Total	100	100	100

Total may not sum to 100 percent due to rounding.

* Respondents with workers who have NZQA qualifications.

Training

Respondents were asked if, during their most recent financial year, they had any training practices in place to upskill their workers. Table 28 shows the results to this question, with the key findings being:

1. Most respondents stated they **did have training practices** in place; most frequently, on the job training (72 percent). This was the case for both respondents operating “small” nurseries and those operating “medium-large” nurseries (70 percent and 74 percent respectively).
2. However, aside from on-the-job training, relatively few

respondents stated they had had more formal training practices in place (e.g. 16 percent reported they had training in place for the NZ Certificate of Horticulture and 5 percent stated they had training for the NZ Certificate in Primary Industry Skills). This was more likely the case for respondents operating “medium-large” nurseries compared with those operating “small” nurseries.

3. Furthermore, 18 percent of respondents stated they had had **no** training in place (either on-the-job or formal). This was twice as likely to be the case for respondents operating ‘smaller’ nurseries compared with those operating “medium-large” nurseries (25 percent and 12 percent respectively).

Table 28: Training practices

	Base =	All respondents	Small	Medium-large
		140	63	77
		%	%	%
No training practices		18	25	12
On the job training		72	70	74
NZ Certificate in Horticulture		16	3	26
NZ Certificate in Nursery Production		14	6	21
NZ Certificate in Primary Industry Skills		5	0	9
University courses (e.g. Dip. Hort. Management, NZ Certificate in Business)		4	2	6
Other		8	3	12
Don't know		3	2	4
Total		**	**	**

Total may exceed 100 percent because of multiple response.

Technology

Respondents were asked to identify the technologies and automation systems their nursery was currently using. Table 29 presents the result to this question, with the key findings being:

1. Overall, well over one-third of respondents stated their nursery was using an electronic inventory system (41 percent) and/or environmental monitoring system (37 percent). All other technologies were less frequently mentioned, including automated potting systems (28 percent) and seed sowing systems (26 percent).
2. In fact, 32 percent of respondents reported that their

nursery did **not** use any of the listed technologies. This was more likely the case with respondents operating “small” nurseries (59 percent) compared with those operating “medium-large” nurseries (9 percent).

3. As a result, respondents operating “medium-large” nurseries were significantly more likely to state that their nursery was using all the technologies covered by the survey (e.g. 53 percent stated their nursery had an electronic inventory and an environmental monitoring system compared with 26 percent and 16 percent respectively for “small” nurseries).

Table 29: Technologies and automation systems currently being used

	All respondents 136	Small 61	Medium-large 75
Base =	%	%	%
Electronic inventory	41	26	53
Environmental monitoring (e.g. water, nutrients, temperature)	37	16	53
Automated potting	28	3	48
Seed sowing	26	11	37
Other	17	10	23
Not using any of the above	32	59	9
Don't know	1	0	1
Total	**	**	**

Total may exceed 100 percent because of multiple response.

Against this background, respondents were also asked to identify which of these technologies and automation systems their nursery would most likely use if it ‘resulted in improved performance/production’. Table 30 presents the result to this question, with the key findings being:

1. Overall, only one technology was identified by more than one-half of all respondents as a technology their nursery would use to improve its performance/production, namely environmental monitoring (58 percent).
2. However, this is mostly a result of the fact that respondents operating “small” nurseries were less likely to be interested in any of the technologies. In fact, one-in-four categorically stated they were not interested in any (16 percent).

3. In comparison, more than one-half of those operating “medium-large” nurseries expressed an interest in electronic inventory systems (57 percent), automated potting systems (57 percent) and environmental monitoring systems (53 percent). Forty-four percent also expressed an interest in seed sowing systems.

Table 30: Technologies and automation systems would use to increase performance/production

	All respondents	Small	Medium-large
	136	61	75
Base =	%	%	%
Environmental monitoring (e.g. water, nutrients, temperature)	54	56	53
Electronic inventory	48	36	57
Automated potting	46	33	57
Seed sowing	35	23	44
Other	13	8	17
Would not use any of the above	8	16	1
Don't know	13	18	9
Total	**	**	**

Total may exceed 100 percent because of multiple response.

Given that most respondents identified more than one technology and automation system, they were also asked to identify the one they would most prefer to use to improve their nursery's performance/production. Table 31 overleaf presents the results to this question and shows two main contenders: automated potting systems (26 percent) and environmental monitoring systems (18 percent).

However, there are significant differences between "small" and "medium-large" nurseries, with automated potting systems preferred by "medium-large" nurseries (32 percent) and environmental monitoring systems preferred by "small" nurseries (30 percent).

Table 31: Technologies and automation systems would most prefer to use to increase performance/production

	All respondents	Small	Medium-large
	136	61	75
Base =	%	%	%
Automated potting	26	18	32
Environmental monitoring (e.g. water, nutrients, temperature)	18	30	9
Electronic inventory	13	7	19
Seed sowing	10	7	12
Other	10	5	15
Would not use any of the above	8	16	1
Don't know	15	18	12
Total	100	100	100

Total may not sum to 100 percent due to rounding.

Science, research and development

In addition to their use of and interest in technologies and automation systems, respondents were asked to identify which subject areas ‘relating to native tree production’ they believed should be investigated. Table 32 presents the result to this question (and Table 33 the subject area that should be investigated first), with the key findings being:

1. Both respondents operating “small” and “medium-large” nurseries most frequently identified **seed supply and storage** as the subject area that should be investigated first. Overall, it was identified by 28 percent of all respondents, followed by **germination rates** at 14 percent.
2. As can be seen from the table below, a number of other subject areas were also frequently identified (e.g. establishment, media composition, mother plants and cuttings-based propagation), which is probably reflected in the fact that when asked which should be investigated first, 23 percent were undecided.

Table 32: Opinions about subject areas relating to native tree production that should be investigated

	All respondents	Small	Medium-large
	138	62	76**
Base =	%	%	%
Seed supply and storage	70	71	70
Germination rates	57	58	57
Establishment	52	52	53
Media composition	49	55	45
Mother plants and cuttings-based propagation	46	45	46
Native tall tree seed orchards	43	39	46
Provenance tracing	42	40	43
Tissue culture approaches	40	32	46
Hardening off	39	45	34
Containerisation of forestry grade	36	37	36
Transport to sites	33	39	29
Don't know	13	13	13
Total	**	**	**

Total may exceed 100 percent because of multiple response.

**Caution: low base number of respondents – results are indicative only.

Table 33: Opinions about subject areas relating to native tree production that should be investigated first (most preferred)

	All respondents	Small	Medium-large
	138	62	76**
Base =	%	%	%
Seed supply and storage	28	26	29
Germination rates	14	11	17
Establishment	9	6	12
Media composition	5	5	5
Mother plants and cuttings-based propagation	4	5	3
Native tall tree seed orchards	7	6	8
Provenance tracing	1	3	0
Tissue culture approaches	4	0	8
Hardening off	1	2	0
Containerisation of forestry grade	1	2	1
Transport to sites	1	3	0
Don't know	23	31	17
Total	**	**	**

Total may exceed 100 percent because of multiple response.

**Caution: low base number of respondents – results are indicative only.

Respondents were also invited to identify other subject areas that they thought were worthy of investigation and 29 percent identified at least one other area. A broad range of areas was identified, including alternative production techniques, robotics, disease and pest control, genetic variation, eco-sourcing, sterilisation, water supply and quality, waste control and weed control.

In addition, there were a number of non-scientific areas suggested for investigation, including the reliability of demand and government funding, as illustrated by the following examples:

- *Creating a reliable demand for plants that we produce. Due to the nature of native tree production, it takes up to 6 years to produce some species. There needs to be a more stable demand structure to invest in these species. Monocots, for example, can be grown within 12 months of germination, while Totorā may be 4 years from germination.*
- *In the last decade the industry has had a lot of economic uncertainty with a number of insolvencies.*

If we want to grow the capacity we need an economic model that gives assurance of a steady increase in demand.

- *How to stop government funded nurseries. The nursery industry does not have a problem to produce trees, scale up and train its staff. MPI/Government have no basis at all to consider either starting up a government nursery or partnering with an existing nursery of their choice.*

To help place the above results into perspective, respondents were asked if their nursery had undertaken or funded any Research and Development during its most recent financial year. Table 34 shows that a little over one-quarter answered this question in the affirmative (28 percent), with this being more frequently the case by respondents operating “medium-large” nurseries (35 percent). However, the table also shows that 62 percent of these nurseries did not conduct or fund any R&D in their most recent financial year.

Table 34: Conducted or funded Research and Development

	All respondents	Small	Medium-large
Base =	140	63	77
	%	%	%
Yes	28	19	35
No	69	78	62
Don't know	3	3	3
Total	100	100	100

Total may not sum to 100 percent due to rounding.

Business development

In this section of the report, we present the results to questions investigating nurseries' future business plans and the extent to which they are supported by operational changes, capital investment, etc.

Short-term business plans

Respondents were asked to indicate their nursery's business plans 'for the next few years':

1. Reflecting some of the workforce results (refer Section 5.1.1, Table 23), Table 35 shows that over one-half of respondents stated they intended to "grow" their business.

2. While most of the remainder intended to 'stay more or less the same size' (35 percent), very few indicated they intended to 'downsize' (1 percent) or 'close down' (1 percent).
3. Respondents operating "medium-large" nurseries were almost twice as likely as those operating "small" nurseries to state they intended to develop their business (71 percent and 38 percent respectively).
4. In contrast, respondents operating "small" nurseries were more likely to say they would downsize or close down, or they didn't know.

Table 35: Business plans next few years

	All respondents	Small	Medium-large
Base =	136	61	75
	%	%	%
Grow	56	38	71
Stay more or less the same size as it is now	35	49	24
Downsize	1	2	1
Close down	1	3	0
Don't know	6	8	4
Total	100	100	100

Total may not sum to 100 percent due to rounding.

Changes made as a result of business plans

Given these business plans, respondents were also asked if they had made any changes to the way their nursery was operated or run during its most recent financial year.

Table 36 shows that almost two-thirds had made changes (64 percent) and this was more frequently reported by respondents intending to “grow” their business (80 percent compared with 46 percent of those operating nurseries intending to keep their business ‘more or less the same size’).

Table 36: Changes made given business plans

	All respondents	Grow	Stay the same	Downsize/ close down/ don't know**
Base =	136	76	48	12
	%	%	%	%
Yes	64	80	46	33
No	36	20	54	67
Total	100	100	100	100

Total may not sum to 100 percent due to rounding.

**Caution: low base number of respondents – results are indicative only.

Respondents who stated they had made changes were asked to identify the nature of the changes they had made. Table 37 overleaf presents the results to this question, by respondents’ stated business plans, with the key findings being:

1. About one-half of respondents or more stated that, in their nursery’s most recent financial year, its productive land area had been increased (67 percent), they had built new infrastructure such as buildings (63 percent), they had changed propagation practices (59 percent), they had changed business practices (56 percent), they had increased machinery use (53 percent), and/or they

had increased the use of technology (49 percent).

2. All these and others, were more frequently identified by respondents with plans to “grow” their business compared with those wanting it to remain more or less the same size.
3. The result for propagation practices is interesting given the earlier results for science, research and development (refer Section 5.3), as are the results for technology (refer Section 5.2) and productive land area (refer Section 3.1.1).

Table 37: Changes made as a result of business plans

	Respondents who have made changes*	Grow	Stay the same	Downsize/ close down/ don't know**
Base =	78	61	14	3
	%	%	%	%
Downsized its productive land area	6	7	0	33
Up sized its productive land area	67	74	43	33
Built new infrastructure (e.g. buildings)	63	69	50	0
Changed propagation practices	59	61	50	67
Changed business practices	56	64	29	33
Increased its use of machinery	53	59	36	0
Increased its use of technology (e.g. automation/ computer systems)	49	56	29	0
Changed production type (e.g. from horticulture to natives)	17	16	14	33
Other	1	2	0	0
Total	**	**	**	**

Total may exceed 100 percent because of multiple response.

*Respondents that had made operational changes as a result of their business plans.

**Caution: low base number of respondents – results are indicative only.

Given the range of changes made, respondents who stated their nursery had made more than one change were also asked to identify the **most** important change it had made. Table 38 overleaf shows the results to this

question, combined with those whose nursery made only one change. This shows the most important change was considered to be **upsizing the nursery's productive land area** (26 percent).

Table 38: Most important change made as a result of business plans

	Respondents who have made changes*			
	Grow	Stay the same**	Downsize/ close down/ don't know**	
Base =	74 %	59 %	12 %	3 %
Up sized its productive land area	26	22	42	33
Built new infrastructure (e.g. buildings)	18	19	17	0
Changed propagation practices	16	15	25	0
Increased its use of technology (e.g. automation/ computer systems)	14	15	8	0
Increased its use of machinery	11	12	8	0
Changed business practices	8	10	0	0
Changed production type (e.g. from horticulture to natives)	3	2	0	33
Downsized its productive land area	1	0	0	33
Other	3	3	0	0
Don't know	1	2	0	0
Total	100	100	100	100

Total may not sum to 100 percent due to rounding.

* Respondents that had made operational changes as a result of their business plans.

**Caution: low base number of respondents – results are indicative only.

When respondents were asked for the reasons they had/ were making these changes, a range of reasons were given from personal reasons (e.g. succession) through to more business-related reasons (e.g. to reduce labour inputs because of lack of skilled labour and expense, to simplify or become more efficient, to upscale/become more productive, to meet targets, etc.). The following verbatim illustrates the nature of these business-related reasons:

- *We made wide sweeping changes including new potting shed, new shade house, new transplant line, large standing area, new irrigation system, new loaders, etc. All these changes were required to allow for increased production and to future proof our business. Our old potting facility was at maximum capacity primarily due to physically being too small.*

Respondents were also asked whether their nursery had invested any capital to make these changes and if they had, to indicate the level of investment they had made. Table 39 presents the results to this question, with the key findings being:

1. One-third of respondents making changes (33 percent) indicated they had spent up to and including \$50,000, another 32 percent between \$50,001 and \$500,000 and 22 percent in excess of \$500,001.
2. This results in a mode falling within the \$50,001-\$500,000 band for those investing capital and an average of \$300,000.
3. Note that most of this investment was made by nurseries planning to “grow” their business.

Table 39: Capital investment in making changes

	Respondents who have made changes*	Grow	Stay the same**	Downsize/ close down/ don't know**
Base =	78 %	61 %	14 %	3 %
No capital investment made	12	3	29	100
Up to and including \$5,000	3	2	7	0
\$5,001-\$20,000	21	18	36	0
\$20,001-\$50,000	9	10	7	0
\$50,001-\$100,000	10	11	7	0
\$100,001-\$500,000	22	26	7	0
\$500,001-\$1 million	10	11	7	0
\$1,000,001 or more	12	15	0	0
Don't know	3	3	0	0
Total	100	100	100	100
Average	300,000	363,525	87,500	0

Total may not sum to 100 percent due to rounding.

* Respondents that had made operational changes as a result of their business plans.

**Caution: low base number of respondents – results are indicative only.

Changes not made

In addition to asking respondents what operating changes their nursery had made, they were also asked to indicate whether there were other changes they wanted to make but did **not** for one reason or other. Table 40 shows that this applies to 71 percent of respondents (after taking account of the 22 percent who did not want to make any other changes and the 7 percent who didn't know):

1. Approximately one-third of respondents stated they were unable to make intended changes in their use of technology (34 percent), or to increase their nursery's productive land area (33 percent), build new infrastructure (32 percent) and increase the number of workers they employed (32 percent).
2. In general, these and other areas were more frequently identified by those wanting to "grow" their business.
3. Note that increasing productive land area and building new infrastructure were the two changes identified earlier as the two most important changes made by respondents making changes (refer Section 5.4.2).
4. Also note these results, given the earlier results for science, research and development (refer Section 5.3), as well as the results for technology (refer Section 5.2), workers (refer Section 5.1.1) and productive land area (refer Section 3.1.1).

Table 40: Intended changes not made

	All respondents	Grow	Stay the same	Downsize/ close down/ don't know
Base =	136	76	48	12**
	%	%	%	%
No changes not made	22	14	31	33
Increase its use of technology (e.g. automation/ computer systems)	34	45	23	8
Up size its productive land area	33	42	25	8
Build new infrastructure (e.g. buildings)	32	42	25	0
Employ more staff	32	39	23	17
Increase its use of machinery	27	37	19	0
Change propagation practices	15	16	17	8
Change business practices	12	12	10	17
Change production type (e.g. from horticulture to natives)	7	8	6	8
Downsize its productive land area	2	0	2	17
Don't know	7	7	4	25
Total	**	**	**	**

Total may exceed 100 percent because of multiple response.

**Caution: low base number of respondents – results are indicative only.

Respondents were also asked to identify the reasons their nursery did **not** make these changes and the results to this question are presented in Table 41 overleaf:

1. This table shows that respondents gave a wide range of reasons for their nursery not making these changes, with the most frequently mentioned including a lack of

capital (56 percent), a lack of time (47 percent), a lack of skilled labour (38 percent) and a lack of the right infrastructure (29 percent).

2. Note that all four were more frequently mentioned by respondents wanting to “grow” their business.

Table 41: Reasons for intended changes not made

	Respondents who did not make intended changes*			
	Base =	Grow	Stay the same	Downsize/ close down/ don't know
	95 %	60 %	31 %	4** %
Lack of capital	56	65	39	50
No time	47	50	45	25
Lack of skilled workers	38	37	39	50
Don't have the right infrastructure	29	33	23	25
Not sure about return on investment	26	28	23	25
COVID-19	23	25	23	0
Lack of technology	12	12	13	0
Personal reasons (e.g. plan to retire)	11	5	23	0
No available land	9	12	6	0
Couldn't get the advice we needed	8	10	6	0
Other	12	10	10	50
Don't know	1	2	0	0
Total	**	**	**	**

Total may exceed 100 percent because of multiple response.

* Respondents who did **not** make intended changes.

**Caution: low base number of respondents – results are indicative only.

Where respondents had given more than one reason, they were asked to identify the most important. Table 42 shows the results to this question, combined with

those who only gave one reason and shows that a **lack of capital** was identified as the most important reason by far (40 percent).

Table 42: Most important reason for intended changes not made

	Respondents who did not make intended changes*			
	Grow	Stay the same	Downsize/ close down/ don't know	
Base =	93	59	30	4**
	%	%	%	%
Lack of capital	40	49	23	25
No time	15	15	17	0
Lack of skilled workers	14	14	13	25
Not sure about return on investment	10	10	7	25
Personal reasons (e.g. plans to retire)	4	0	13	0
COVID-19	3	0	10	0
No available land	2	2	3	0
Don't have the right infrastructure	1	2	0	0
Couldn't get the advice we needed	1	0	3	0
Lack of technology	0	0	0	0
Other	9	7	10	25
Don't know	1	2	0	0
Total	100	100	100	100

Total may exceed 100 percent because of multiple response.

* Respondents who did **not** make intended changes.

**Caution: low base number of respondents – results are indicative only.

Investment partners

As noted in the previous section, a lack of capital investment was provided as the most important reason by some respondents for their nursery not making intended operational changes during its most recent financial year. Against this background, respondents were asked to identify any types of organisations they were aware of that might be interested in investing in nurseries. The results to this question are presented in Table 43, with the key findings being:

1. Overall, two-thirds of respondents were **not** aware of any possible investors (66 percent). This was 63 percent for those wanting to “grow” their business.
2. However, respondents wanting to “grow” their business, were relatively more aware than other respondents of central government (20 percent), catchment groups (16 percent) and councils and local government (15 percent) as potential investors; but all by relatively small percentages of respondents.

Table 43: Awareness of investment partners

	Base =	All respondents 134 %	Grow 75 %	Stay the same 47 %	Downsize/ close down/ don't know** 12 %
Not aware of any		66	63	74	58
Banks		5	8	2	0
Councils and local government		16	15	19	8
Central government		16	20	9	17
Technology providers		1	0	2	0
Training providers		7	5	9	17
Catchment groups		15	16	11	25
Other		7	9	2	17
Total		**	**	**	**

Total may not sum to 100 percent due to rounding.

**Caution: low base number of respondents – results are indicative only.

APPENDIX A: RESPONDENT PROFILE

Table 44: Respondent profile

	All respondents	Small	Medium-large
Base =	140	63	77
	%	%	%
Respondent status:			
Owner	75	81	70
General manager	18	11	23
Other	7	8	6
Total	100	100	100
Business status:			
Private business	89	87	91
Not-for-profit business	9	11	6
Local/national government business	2	2	3
Total	100	100	100
Business type:			
Home gardening/Landscaping	19	24	14
Eco-system restoration	31	43	21
Horticulture	32	27	36
Viticulture	1	0	3
Forestry	4	0	6
Other	14	6	19
Total	100	100	100
Business size:			
A small business (i.e. up to and including 5 workers)	45	100	0
A medium business (i.e. 6-19 workers)	34	0	62
A large business (i.e. 20+ workers)	21	0	38
Total	100	100	100
Identify as a Māori business:			
Yes	9	5	13
No	89	94	84
Don't know	2	2	3
Total	100	100	100
Business location:			
Northland (Te Tai Tokerau)	11	13	9
Auckland (Tāmaki Makau Rau)	25	18	30
Waikato (Waikato)	12	13	11
Bay of Plenty (Te Moana a Toi)	7	5	9
Gisborne (Turanganui-a-Kiwa)	4	2	5
Hawke's Bay (Heretaunga)	4	3	5
Taranaki (Taranaki)	7	8	5
Manawatu-Whanganui (Manawatu-Whanganui)	8	5	11
Wellington-Wairarapa (Te Whanganui-a-Tara/Wairarapa)	9	5	12
Tasman (Te Taihū)	4	5	4
Nelson (Te Taihū)	1	0	3
Marlborough (Te Taihū)	4	3	4
West Coast (Te Tai Poutini)	3	5	1
Canterbury (Waitaha)	17	13	20
Otago (Otago)	4	5	4
Southland (Murihiku)	3	3	3
Total	100	100	100

Total may not sum to 100 percent due to rounding.

APPENDIX B: QUESTIONNAIRE

Te Uru Rākau – New Zealand Forest Service Survey – FINAL

Online version (dated 04-11-22) Version 4 (V2)

Research New Zealand P/N #5315

November 2022

Logo: New Zealand Forest Service and Research New Zealand

Kia ora. Welcome to the Te Uru Rākau – New Zealand Forest Service Survey!

The survey is voluntary; it is your choice whether you complete it or not. However, given the purpose of the survey (to identify the barriers to the availability, supply and cost of native tree seedlings), it is important that we get the best possible response from as many nurseries as possible – even if you don't currently produce them.

Confidentiality

The survey is being conducted on behalf of Te Uru Rākau – New Zealand Forest Service with the help of NZPPI and Research New Zealand (www.researchnz.com). Research New Zealand operates in accordance with the Code of Practice of the European Society of Opinion and Market Research (ESOMAR).

This guarantees your confidentiality. You can read more about Research New Zealand's privacy policy [here](#).

How long is the survey?

The survey takes up to 15 to 20 minutes to complete online, depending on your answers. You can come back to complete the survey later if you do not have time to finish it all at once. Using the link we have provided, when you log back in, you will be taken back to the point where you left off.

The survey should be completed by the owner/general manager of your business, although you may need to confirm some answers with support staff.

If you would like the text to appear larger in the survey, please click this button.

SECTION 1 – NURSERY DETAILS

Please answer the following questions about your nursery. The results to these questions will be used to group similar nurseries together, in order to examine their results. If your business operates across a number of sites, please answer the questions for all the sites as a total.

Q1 First of all, which one of the following best describes your role in your business?

- 1 I am an owner
- 2 I am the general manager
- 96 Other

Q2 Which **one** of the following sectors **best** describes your business?

- 1 Home Gardening/Landscaping
- 2 Eco-system restoration
- 3 Horticulture
- 4... Viticulture
- 5... Forestry
- 96 Other **Please specify**

Q3 Does your business operate as ...

- 1 A private business
- 2 A not-for-profit business
- 3 A local/national government business

Q4 Which one of the following best describes its current size in terms of workers? Is it ...

- 1 A small business (i.e. up to and including 5 workers)
- 2 A medium business (i.e. 6-19 workers)
- 3 A large business (i.e. 20+ workers)
- 98 Don't know

Q5 Does your business identify as a Māori business?

- 1 Yes
- 2 No
- 98 Don't know

Q6 About how much productive land area does your business currently have of each of the following types:

- Green house (commonly used for germination/seedling production)
- Shade house (commonly used for growing seedlings)
- Standing out area
- Bare/open ground

If you're unsure of the area, an estimate will do. Please make sure you provide an answer for each type.

	Green house (commonly used for germination/ seedling production)	Shade house (commonly used for growing seedlings)	Standing out area	Bare/open ground
Area	Write the number of square metres here	Write the number of square metres here	Write the number of hectares here	Write the number of hectares here
No area	0	0	0	0
Don't know	98	98	98	98

Q7 Based on how you have answered the previous question, what is the current total productive land area of your business, in hectares, taking all types of land use into account?

- Up to 1 hectare
- 1-5 hectares
- 6-10 hectares
- 11-15 hectares
- 16 hectares plus
- 98 Don't know

Q8 What is your business's current total productive land area as a percentage of its total available land area?

- Up to and including 10%
- 11-20%
- 21-30%
- 31-40%
- 41-50%
- 51-60%
- 61-70%
- 71-80%
- 81-90%
- 91-99%
- 100%
- 98 Don't know

Q9 Throughout this questionnaire, you will see that we will ask you questions about:

- The financial year your business has **most** recently completed.
- The **current** financial year.

To help us understand the answers to these questions, please indicate below when your business's most recent financial year ended.

- 1 Year ended 31 March 2022
- Year ended 30 June 2022
- Other **Please specify**

SECTION 2 – YOUR BUSINESS’S PRODUCTION IN THE LAST FINANCIAL YEAR

The questions in this section are about your business’s tree production during the financial year your business **most** recently completed.

Q10 Please tell us how many seedlings your business sold to plant of each of the following types (trees, shrubs, grasses and flaxes, and other plants) during the last financial year. Please do not count plants it sold to another nursery.

	a. Trees (which grow to at least 5 metres in height)	b. Shrubs (which grow to less than 5 metres in height)	c. Grasses and flaxes	d. All others (e.g. ground covers, ferns and vines)
Write the number here	Write the number of trees here	Write the number of shrubs here	Write the number of grasses & flaxes here	Write the number of other plants here
None	0	0	0	0
Don't know	98	98	98	98

Q11 Which one of the following best describes your business’s actual production in the last financial year, as a percentage of its production capacity?

- Up to and including 10%
- 11-20%
- 21-30%
- 31-40%
- 41-50%
- 51-60%
- 61-70%
- 71-80%
- 81-90%
- 91-99%
- 100%
- 98 Don't know

Q12 About what is the maximum number of seedlings your business could grow in its current productive area?

- Up to and including 5,000
- 5,001-10,000
- 10,001-50,000
- 50,001-500,000
- 500,001-1,000,000
- 1,000,001-2,000,000
- 2,000,001 or more
- 98 Don't know

Q13 Now thinking specifically about trees which grow to at least 5 metres in height.

Please tell us how many seedlings your business sold to plant of each of the following types of tree (native, non-native, horticultural, and other) during the last financial year.

	a. Native trees	b. Non-native	c. Horticultural	d. Other
Number produced and sold	Write the number of trees here	Write the number of trees here	Write the number of trees here	Write the number of trees here
None	0	0	0	0
Don't know	98	98	98	98

Q14 If Q13a=0 ask, else skip to Q16 To what extent would your business consider growing native tree seedlings?

Would not consider at all

- Would seriously consider
- 98 Don't know

Q15 If Q14=1-3 ask, else skip to Q18 And for what reasons would you not consider this?

- Comment **Please provide a detailed answer here**
- 98 Don't know

Now go to Q18

Q16 If Q13a DOES NOT=0/98 ask, else skip to Q18 To what extent would you consider growing more native tree seedlings?

Would not consider it at all

- Would seriously consider it
- 98 Don't know

Q17 If Q16=1-3 ask, else skip to Q18 And for what reasons would you not consider this?

- Comment **Please provide a detailed answer here**
- 98 Don't know

Q18 Still thinking about the production and sale of native tree seedlings. How much do you agree or disagree that each of the following is a barrier to your business [producing/producing more] native tree seedlings? Please provide an answer for each statement. RDN?

	1 Not a reason at all	2	3	4	5 A very important reason	98 Don't know
We don't have enough available land	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We don't have the technology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We don't have the infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We don't have enough water	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We don't have the capital to make the investment required	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We don't have the time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of demand	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We are happy producing what we are producing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q19 Are there any other major barriers?

Comment Please provide a detailed answer here

- 98 Don't know

Q20 How does the production and sale of native tree seedlings in the last financial year compare with the year before that

- No native trees produced the year before the last financial year
- More
- About the same
- Less
- 98 Don't know

Q21 If Q20=2/4 ask, else skip to Q22 About what percentage of native tree seedlings did your business produce and sell [more/less] of in comparison?

Up to and including 10 percent

- 11-20 percent
- 21-30 percent
- 31-40 percent
- 41-50 percent
- 50-75 percent
- 76-100 percent
- 98 Don't know

Q22 Thinking now about eco-sourcing. That is, seeds which are collected close to where seedlings are then planted. Using the scale below, how would you describe the current demand for eco-sourced seedlings?

- A very low level of demand
- Not much of a demand
- Neither a high nor low level of demand
- Somewhat of a demand
- A very high level of demand
- Don't know

SECTION 3 – YOUR WORKFORCE

Thank you, you're a good half-way through this survey.

The questions in this section are about the people that work in your business, either as paid employees or as volunteers.

Q23 How many people worked for your business at the end of the last financial year.

Please include the business owner(s), but only if they were actively working in the business.

	Full-time workers (someone who worked 30 hours or more/week)	Part-time workers (someone who worked less than 30 hours/week)	Fixed term workers (including seasonal workers)	Volunteers
None	1	1	1	1
1-5	2	2	2	2
6-10	3	3	3	3
11-20	4	4	4	4
21 or more	7	7	7	7
Don't know	98	98	98	98

Q24 Considering how you answered the previous question, how many people, in total, did your business have working for it at the end of the last financial year? Please include the business owner(s), but only if they were actively working in the business.

- One
- 2-5
- 6-11
- 12-19
- 20-49
- 50 or more
- 98 Don't know

Q25 How does the total number of workers that your business had at the end of the last financial year compare with the financial year before that? And what are your business's plans in terms of workers for the current financial year?

Please include the business owner(s), but only if they were actively working in the business. Please make sure you provide an answer for each year.

	Financial year before the most recent	Current financial year
More workers	1	1
About the same	2	2
Fewer workers	3	3
Don't know	98	98

Q26 Did any of the workers your business had last financial year have NZQA-level qualifications? That is, NZQA Level 1 or above.

- Yes
- No
- Don't know

If Q26a=2/97 skip to Q28, else ask About what percentage of workers have each of the following qualifications, if any. If you're not exactly sure, an estimate will do.

Write in the percentage using two numbers (e.g. '05', '10') and make sure the total adds to 100 percent.

	Percentage
NZQA Level 1-3 (high school)	
NZQA Level 4 (certificate)	
NZQA Level 5-6 (diploma)	
NZQA Level 7 or above (bachelor's degree or higher)	
Don't know	
Total	100 %

Q27 What percentage of these workers had qualifications in agriculture, horticulture or nursery production?

- Up to and including 10%
- 11-20%
- 21-30%
- 31-40%
- 41-50%
- 50-75%
- 76-100%
- Don't know

Q28 Which training practices, if any, did your business have in place during the last financial year?

Please tick all that apply.

- **No** training practices
- On-the-job training
- NZ Certificate in Horticulture
- NZ Certificate in Nursery Production
- NZ Certificate in Primary Industry Skills
- University courses (e.g. Dip. Hort. Management, NZ Certificate in Business)
- Other **Please specify**
- 98 Don't know

Q29 What percentage of the total number of people (of all types) working for your business at the end of the last financial year, were New Zealanders? If you're not exactly sure, an estimate will do.

Please make sure you provide a percentage for each country.

Write in the percentage using two numbers (e.g. '05', '10') and make sure the total adds to 100 percent.

	Percentage
New Zealanders	
People from other countries	
Don't know	
Total	100 percent

Q30 Did your business experience any difficulties recruiting workers during its last financial year?

- Yes
- No
- Not applicable (i.e. did not recruit)
- 98 Don't know

Q31 As an industry, what skill shortages are being experienced?

Comment Please provide a detailed answer here

- 98 Don't know

Q32 Why is the industry experiencing these shortages?

Comment Please provide a detailed answer here

- 98 Don't know

SECTION 4 – INNOVATION AND SCIENCE

The questions in this section relate to your business's use of, and opinions, about systems that result in improved performance/production.

Q33 Which of the following technologies and automated systems is your business currently using? RDN

Environmental monitoring (e.g. water, nutrients, temperature)

- Seed sowing
- Electronic inventory
- Automated potting
- Other Please specify
- 97 Not using any of the above
- 98 Don't know

Q34 And which of these would your business most likely use if they resulted in improved performance/production?

Environmental monitoring (e.g. water, nutrients, temperature)

- Seed sowing
- Electronic inventory
- Automated potting
- Other Please specify
- 98 Don't know

Q34a If more than one selected in Q34 (1-4) ask, else skip And which one would you most prefer?

Environmental monitoring (e.g. water, nutrients, temperature)

- Seed sowing
- Electronic inventory
- Automated potting
- Other Please specify
- 98 Don't know

Q35 If there are other technologies and automated systems that your business would consider using, please list them here.

Comment Please provide a detailed answer here

- 97 No other technology/systems
- 98 Don't know

Q36 In the table below, we have listed a number of subject topics that relate to native tree production, which are based on Western science and mātauranga approaches. RDN

Please answer this question even if your business has no plans to produce and sell native trees this current year.

Which of the following do you believe should be investigated?

- Seed supply and storage
- Provenance tracing
- Germination rates
- Mother plants and cuttings-based propagation
- Tissue culture approaches
- Media composition
- Containerisation of forestry grade
- Hardening off
- Transport to sites
- Establishment
- Native tall tree orchards
- 98 Don't know

Q36a If more than one selected in Q36 (1-11) ask, else skip Which of the following do you believe should be investigated first?

- Seed supply and storage
- Provenance tracing
- Germination rates
- Mother plants and cuttings-based propagation
- Tissue culture approaches
- Media composition
- Containerisation of forestry grade
- Hardening off
- Transport to sites
- Establishment
- Native tall tree orchards
- 98 Don't know

Q37 Are there any other subject topics that you believe should be investigated.

Comment Please provide a detailed answer here

- 97 No other subject topics
- 98 Don't know

Q38 Did your business undertake or fund any Research and Development during the last financial year?

- Yes
- No
- Don't know

Q39 If Q38=1 ask, otherwise skip to Q40 What Research and Development in particular, did it undertake or fund?

Comment Please provide a detailed answer here

- 97 No other research or development
- 98 Don't know

SECTION 5 – FINAL QUESTIONS

Thank you for answering the questions in the previous sections.

This section has our final questions.

Q40 Which one of the following best describes your business's plans for the next few years? Does it plan to ...

- 1 Grow
- 2 Stay more or less the same size as it is now
- 3 Downsize
- 4 Close down
- 98 Don't know

Q41 With these plans in mind, did it make any changes to the way it operates or is run in the last financial year?

- 1 Yes
- 2 No

Q42 If Q40=1 ask, otherwise skip to Q46 Which of the following changes did the business make?.

- Down sized its productive land area
- Up sized its productive land area
- Increased its use of machinery
- Increased its use of technology (e.g. automation/computer systems)
- Built new infrastructure (e.g. buildings)
- Changed business practices
- Changed propagation practices
- Changed production type (e.g. from horticulture to natives)
- 96 Other

Q42a If more than one selected in Q42 (1-8) ask, else skip Which one was the most important?.

- Down sized its productive land area
- Up sized its productive land area
- Increased its use of machinery
- Increased its use of technology (e.g. automation/computer systems)
- Built new infrastructure (e.g. buildings)
- Changed business practices
- Changed propagation practices
- Changed production type (e.g. from horticulture to natives)
- 96 Other
- 98 Don't know

Q43 Please tell us which of the following were or were not reasons for making this **most important** change?.

- Health and safety
- Business's financial performance/profitability
- COVID-19 pandemic disruption
- To comply with regulations)
- Climate change
- The general state of the NZ economy
- The availability of new technology
- Recruitment difficulties
- Access to investment capital
- Changes in the demographics of the NZ labour force
- Government funding available
- 96 Other
- 98 Don't know

Q43a If more than one selected in Q43 (1-11) ask, else skip And which one of these was the most important reason for making this change?

- Health and safety
- Business's financial performance/profitability
- COVID-19 pandemic disruption
- To comply with regulations)
- Climate change
- The general state of the NZ economy
- The availability of new technology
- Recruitment difficulties
- Access to investment capital
- Changes in the demographics of the NZ labour force
- Government funding available
- 96 Other
- 98 Don't know

Q44 Were there any other reasons for making these changes?

- Comment **Please provide a detailed answer here**
- 97 **No** other reasons
- 98 Don't know

Q45 If your business invested capital to make any of the changes, use the bands below to tell us about how much.

Please remember this is a confidential survey. If you're unsure, an estimate will do.

- No capital investment made
- Up to and including \$5,000
- \$5,001-\$20,000
- \$20,001-\$50,000
- \$50,001-\$100,000
- \$100,001-\$500,000
- \$500,001-\$1 million
- \$1,00,001 or more
- 98 Don't know

Q46 Did your business want to make any other changes, but didn't? What were these other changes? Please tick all that apply.

- No other changes
- Up size its productive land area
- Down size its productive land area
- Increase its use of machinery
- Increase its use of technology (e.g. automation/computer systems)
- Build new infrastructure (e.g. buildings)
- Change business practices
- Employ more staff
- Change propagation practices
- Change production type (e.g. from horticulture to natives)
- 98 Don't know

Q47 If Q46=1 skip, else ask Which of the following reasons explain why your business did not make these changes?.

- Lack of capital
- No time
- Couldn't get the advice we needed

- COVID-19
- No available land
- Lack of skilled workers
- Lack of technology
- Didn't have the right infrastructure
- Personal reasons (e.g. plan to retire)
- Not sure about the return on investment
- 96 Other
- 98 Don't know

Q47a If more than one selected in Q47 (1-10) ask, else skip And which one of these was the most important reason?

- Lack of capital
- No time
- Couldn't get the advice we needed
- COVID-19
- No available land
- Lack of skilled workers
- Lack of technology
- Didn't have the right infrastructure
- Personal reasons (e.g. plan to retire)
- Not sure about the return on investment
- 96 Other
- 98 Don't know

Q48 Still thinking about your business's last financial year, in which of the following did your business participate in or supply tree seedlings to, if any?

You can tick as many as you like in each of the columns.

	Participated in or used	Supplied plants to
Local restoration projects	1	1
Farmers, Regional/Local Council Land Management Programmes	2	2
Trees that Count marketplace	3	3
Government grants (Afforestation Grant, 1BT, Jobs for Nature, Million Metres Streams Project)	4	4
Plant Production Biosecurity Scheme (NZPPI)	5	5
Emissions Trading Scheme (ETS)	6	6
NIASA/Eco Hort. Accreditation Scheme	7	7
Have not participated/used/supplied plants	97	97
Don't know	98	98

Q49 If Q48=97/98 skip, else ask Q50 Were there any other projects or programmes your business participated in or used, or supplied plants to?

- Comment **Please provide a detailed answer here**
- 97 **No** other projects or programmes
- 98 Don't know

Q50 In which of the following areas of the country is your business located? Tick as many as apply.

- 1.... Northland (Te Tai Tokerau)
- 2.... Auckland (Tāmaki Makau Rau)
- 3.... Waikato (Waikato)
- 4.... Bay of Plenty (Te Moana a Toi)
- 5.... Gisborne (Tūranganui-a-Kiwa)
- 6.... Hawke’s Bay (Heretaunga)
- 7.... Taranaki (Taranaki)
- 8.... Manawatū-Whanganui (Manawatū-Whanganui)
- 9.... Wellington-Wairarapa (Te Whanganui-a-Tara/Wairarapa)
- 10.. Tasman (Te Taihū)
- 11.. Nelson (Te Taihū)
- 12.. Marlborough (Te Taihū)
- 13.. West Coast (Te Tai Poutini)
- 14.. Canterbury (Waitaha)
- 15.. Otago (Otago)
- 16.. Southland (Mūrihiku)

Q51 Which of the following best describe the types of customers your business supplies plants to? Please tick all that apply.

- Councils and local government
- Central government
- Farmers
- Forestry companies
- Landscaping/Gardening businesses
- Catchment groups
- Other **Please specify**

Q52 And are these customers located in ...?

- The region(s) your business is mainly located in
- Regions close by
- Nationally
- Internationally
- 98 Don’t know

Q53 Which **one** of these areas is the **furthest** area that your business sends seedlings to?

- 1.... Northland (Te Tai Tokerau)
- 2.... Auckland (Tāmaki Makau Rau)
- 3.... Waikato (Waikato)
- 4.... Bay of Plenty (Te Moana a Toi)
- 5.... Gisborne (Tūranganui-a-Kiwa)
- 6.... Hawke’s Bay (Heretaunga)
- 7.... Taranaki (Taranaki)
- 8.... Manawatū-Whanganui (Manawatū-Whanganui)
- 9.... Wellington-Wairarapa (Te Whanganui-a-Tara/Wairarapa)
- 10.. Tasman (Te Taihū)
- 11.. Nelson (Te Taihū)
- 12.. Marlborough (Te Taihū)
- 13.. West Coast (Te Tai Poutini)
- 14.. Canterbury (Waitaha)
- 15.. Otago (Otago)
- 16.. Southland (Mūrihiku)

Q54 Which of the following types of organisations is your business aware of that are interested in investing in nurseries?

Not aware of any

- Banks
- Councils and local government
- Central government
- Technology providers
- Training providers
- Catchment groups
- Other **Please specify**

Q55 Which of the following industry groups does your business have regular contact with?

No contact with any groups

- IPPS
- NZ Forest Service
- NZPPI
- Other **Please specify**

Q56 Which of the following industry groups does your business have regular contact with?

No contact with any groups

- IPPS
- NZ Forest Service
- NZPPI
- Other **Please specify**

Q57 If Q5=1 ask, else skip Earlier you identified your business as a Māori business. New Zealand Forest Service would like to know whether you would be willing to be contacted by them to discuss, share and receive support about mātauranga approaches to native tree production.

If you are agreeable, please provide your consent here.

- 1 Yes, I provide my consent for New Zealand Forest Service to make contact
- 2 No, I do **not** provide my consent

Q58 If 57=1 ask, else skip Thank you for providing your consent. Please confirm your name and best contact details here:

Your name: Please write this here

Your email address: Please write this here

Your phone number: Please write this here

Q59 As you know, everyone who completes the survey can go into a draw to win one of three prizes – Personal Locator Beacon, set of 4 -2 way walkie talkies, or an iPhone 13. If you want to enter this draw, please confirm your name and the best way to contact you here:

Your name: Please write this here

Your email address: Please write this here

Your phone number: Please write this here

That is the end of the survey. Thank you for your time in taking part.