



Department of  
Primary Industries

# NSW Apple Industry Baseline Survey 2019



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## Abstract

The apple industry is the highest value fruit industry in Australia (\$490 million) (Apple and Pear Australia, 2019a), however, a national benchmarking project identified some major challenges facing the industry. These challenges included oversupply to markets, increasing input costs, variable yields, and a lack of export competitiveness and reliable data on tree plantings to inform decision making (Apple and Pear Australia, 2019a).

To determine if these challenges are reflected in the NSW apple industry and to identify opportunities for research and development, a 35-question survey was distributed to all apple growers on NSW Department of Primary Industries (NSW DPI) mailing lists (n=56).

Twenty-five growers responded, giving an overall response rate of 45% with a fairly even distribution between Batlow (32%), Orange (32%) and Bilpin (28%). The majority (92%) of respondents were aged between 46 and 75 years; 8% were female and 72% were first or second generation farmers. Most (64%) orchards were between 1 and 30 hectares. Apples are the main (88%) commodity produced by respondents with cherries, hazelnuts and stone fruit contributing 4% each.

The survey results showed that Pink Lady™ and Gala™ high colour strain varieties were the most planted (86.6 and 75.6 hectares respectively) while Braeburn and Sundowner were the least planted (3.2 and 3.6 hectares respectively).

The survey responses suggest that NSW apple yields (reported in t/ha) were higher than the national average for Pink Lady™, Kanzi™ and Red Delicious but lower for Jazz™, Granny Smith and Sundowner. Most (88%) respondents were using protective netting and 63% use drip irrigation. Just over half of respondents have cold storage and packing facilities onsite.

Unsurprisingly, casual employees were the predominant labour source and the majority gain employment during picking. While 56% of orchardists were using some form of labour-saving technology, the anticipated uptake of further orchard technology is low (16%). Wholesale markets were used most by orchardists (76.1%) and only 2% market their produce internationally.

Labour (cost and source), income, market and climate were identified as the major challenges facing growers and the industry. New integrated pest management (IPM) strategies were identified as the most important area requiring research, development and extension (RD&E). Labour-saving robotics and soil and plant nutrition were also high priorities. Identifying these key challenges and priorities will help to inform future RD&E programs to best support NSW apple producers.

# Methods

## The survey

A six-page questionnaire containing 35 questions ([Appendix 1](#)) was designed to be completed in an estimated 10 minutes. Respondent confidentiality was ensured by using the anonymous survey platform 'SurveyMonkey Design®'. Participation in the survey was voluntary, however, as an incentive to complete the survey, a GDOT soil moisture sensor valued at \$290 was offered as a randomly drawn prize for one respondent after the closing date. Twenty-five NSW apple growers responded to the survey which was open from 15 July to 29 August 2019. The winner of this sensor was drawn on 26 August 2019 at the Orange Agricultural Institute and notified by email.

The survey questions were grouped into four categories. The first page of questions (1 to 13) investigated the demographics and production statistics of the orchards. Questions 14 to 21 focused on management practices that made up the day-to-day running of the orchard. Questions 22 to 28 asked the respondent to comment on their postharvest and marketing strategies, whilst Questions 29 to 35 looked at future areas of research.

## Target population

The target population for this survey was all NSW apple growers that were on the NSW Department of Primary Industries mailing list (n=56, July 2019). The survey link was emailed to all growers and three reminder emails were sent before the closing date.

## Data analysis

The data were entered into an Excel spreadsheet for analysis. The response rate was calculated as the total number of completed surveys returned relative to the total number distributed. Percentages were calculated as a proportion of the total number of respondents for each question and did not include non-respondents. Average production yield was calculated by totalling the respondents' answer to average yield and dividing by the number of responses received for that question.

# Results

## Response rate

Of the 56 surveys distributed, 25 were returned completed giving a response rate of 45%. The response rate from the Bilpin region (28%) was similar to the major centres of Batlow (32%) and Orange (32%, [Figure 1](#)).

## Demographics

### Industry age profile

Ages were grouped into 10 year cohorts from 18 to >75 years. The grower's age profile showed a trend that is common across most rural industries; having a higher proportion of growers over 50 years. Most respondents were in the 56-65 age category, and there were few below 45 years ([Figure 2](#)).



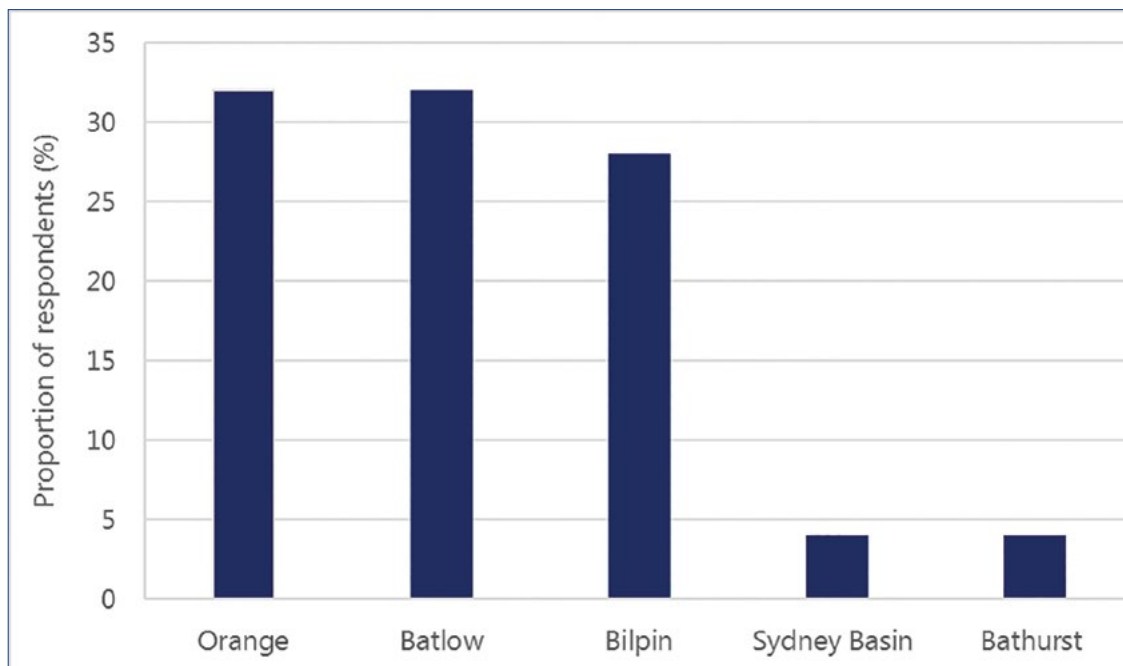


Figure 1. Location of NSW apple growers who responded to the survey.

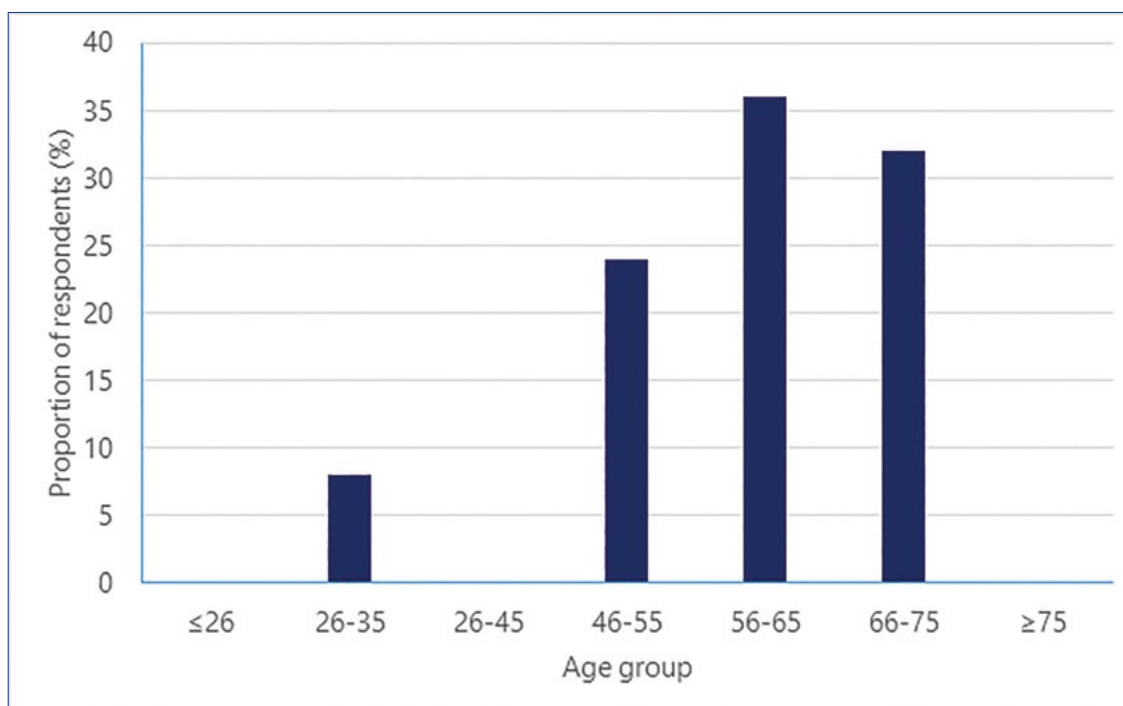


Figure 2. Survey respondent age distribution.

**Industry gender profile**

There was a significant gender disparity among the respondents; only 8% (n=2) of the 25 respondents were female (Figure 3).

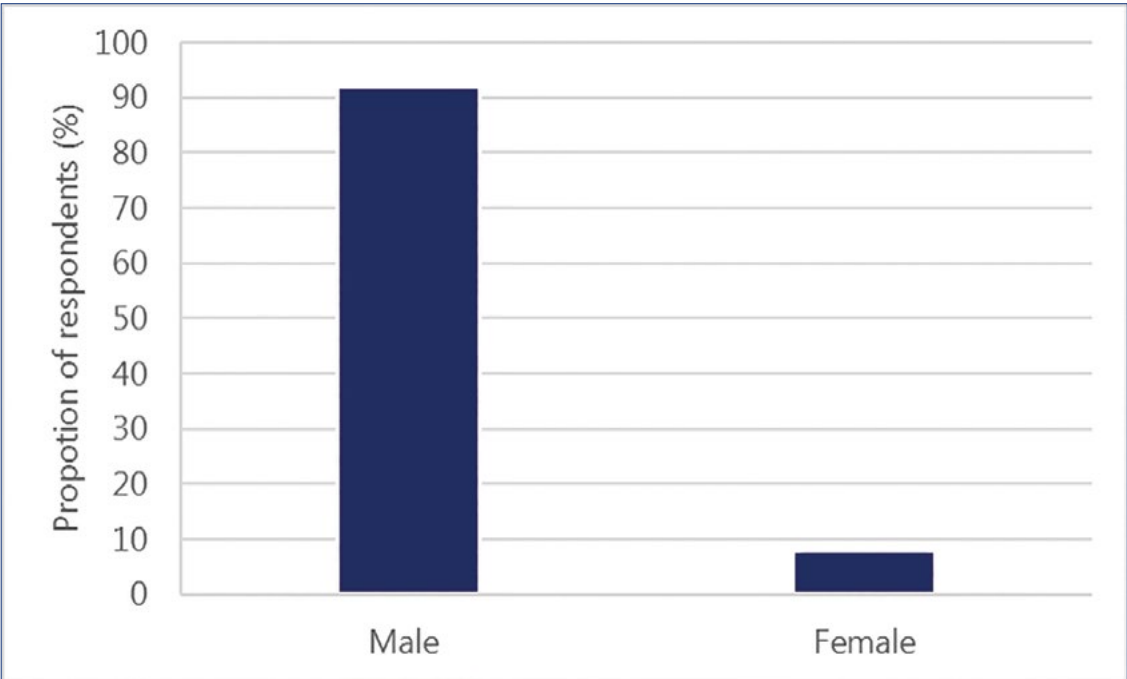


Figure 3. The proportion of male to female respondents.

**Generation of growers**

Interestingly, a majority of respondents were first or second generation orchardists (Figure 4).

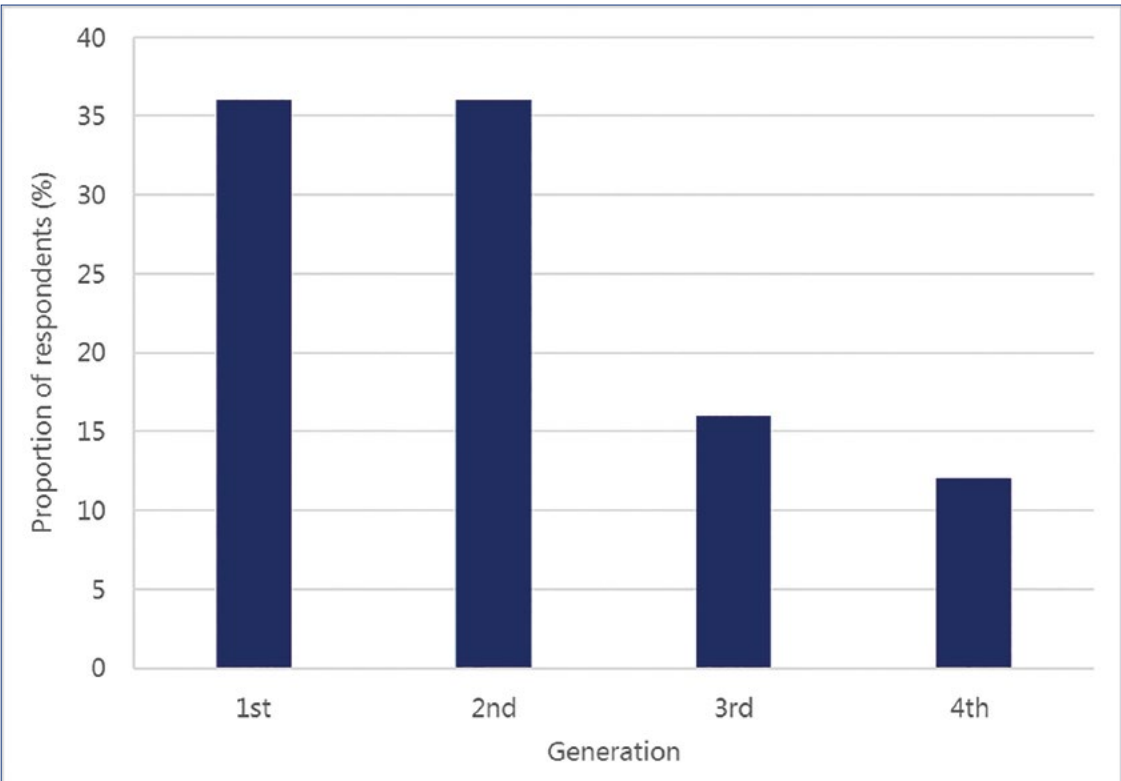


Figure 4. Generation of orchardist.



## Orchard characteristics

### Size of productive orchard

Most (64%) of the NSW apple orchard properties captured in this survey include between 1 and 30 hectares of productive orchard (Figure 5). Only 20% are greater than 40 hectares.

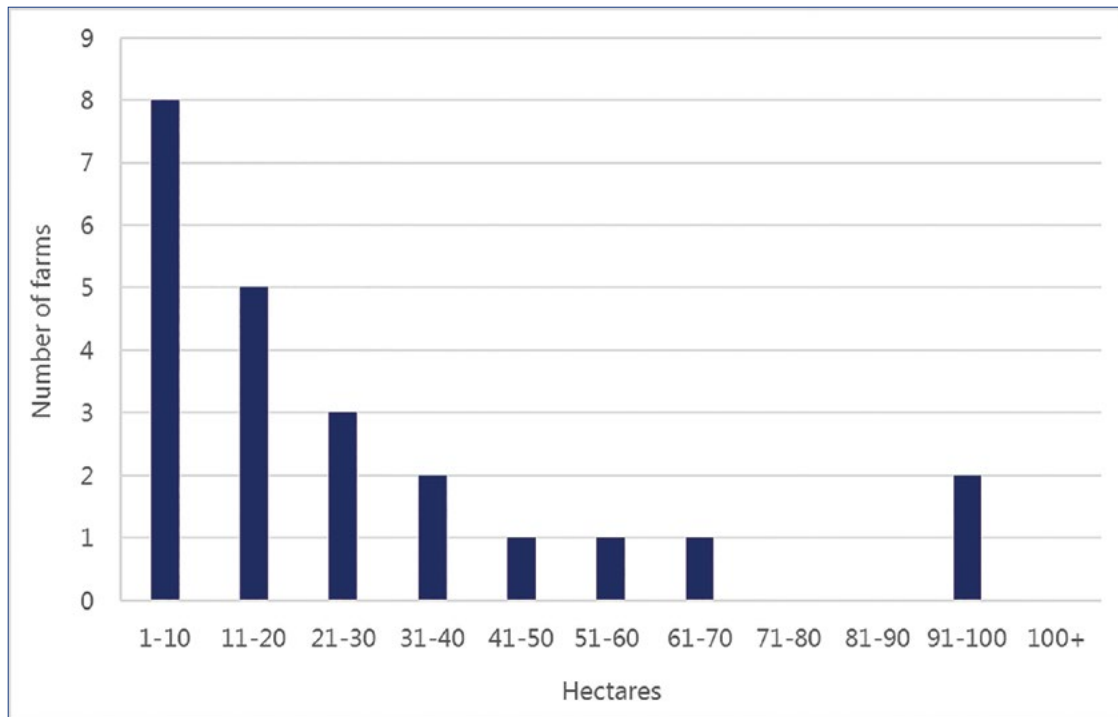


Figure 5. Size of productive apple orchards according to respondent.

Apples are the main (88%) commodity produced by respondents with cherries, hazelnuts and stone fruit contributing 4% each (Figure 6).

To capture any possible future trend towards cherry production, respondents were asked "If applicable, what best describes your future planted area for cherries?" Results showed that more respondents (54%) were considering increasing their cherry plantings than maintaining (38%) or decreasing (8%) their plantings (Figure 7).

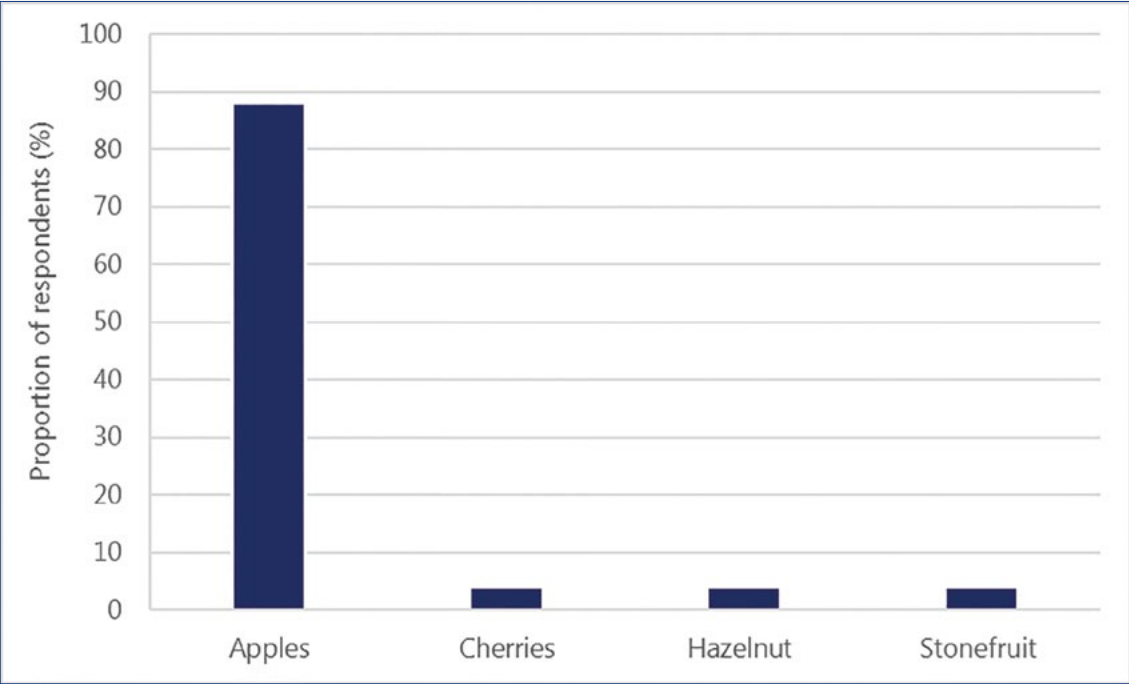


Figure 6. Main enterprise on survey respondent's farms.

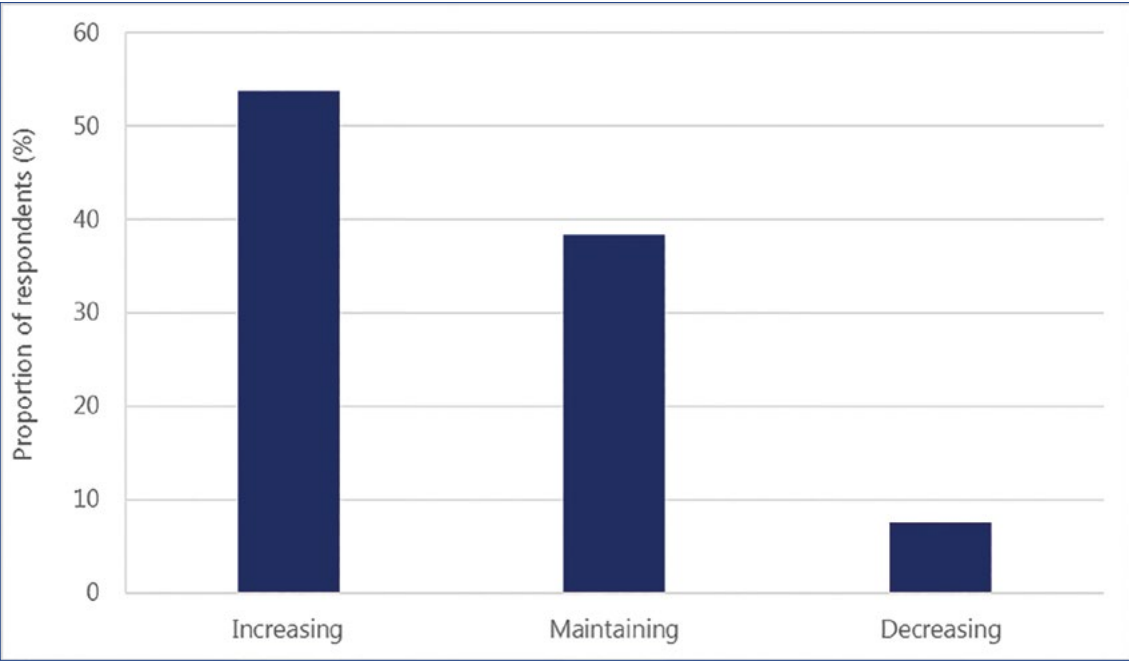


Figure 7. Future cherry planting intentions of survey respondents.

## Orchard management practices

### Current varieties planted in NSW

Respondents were asked which varieties they are growing and how many hectares they have of each variety. According to respondents, a total of 480 hectares in NSW are productive apple orchards. Pink Lady™ (Cripps Pink) high colour strain varieties, which include Rosy Glow, Lady in Red and Ruby Pink, are the most commonly varieties (86.6 ha) planted in NSW, while Braeburn and Sundowner are the least planted varieties (3.2 and 3.6 ha respectively; Table 1).

Given the low number of varieties per respondent, average yields were used in the analysis. Kanzi™ (Nicoter) generated the highest average yield of 60-70 t/ha (Table 1).

Table 1. Area planted, yield and typical packout by key variety for survey respondents.

	Pink Lady™	Pink Lady™ HCS <sup>2</sup>	Gala	Gala HCS	Kanzi™	Jazz™	Bravo™	Red Delicious	Fuji	Granny Smith	Jonathan	Braeburn	Sundowner
<b>Total area<sup>1</sup> (ha)</b>	38.2	86.6	40.4	75.6	59.0	7.0	10.6	69.4	56.6	23.2	7.0	3.2	3.6
<b>Largest planting (ha)</b>	13	16+	11	12	16+	7	5	16+	16+	6	1	<1	1
<b>Smallest planting (ha)</b>	<1	<1	<1	<1	1	7	<1	<1	<1	<1	<1	<1	<1
<b>Highest yield (t/ha)</b>	50-60	90-100	60-70	60-70	80-90	30-40	30-40	60-70	30-40	40-50	40-50	20-30	20
<b>Average yield (t/ha)</b>	30-40	50-60	30-40	30-40	60-70	30-40	30-40	40-50	20-30	30-40	20-30	20-30	20
<b>Average typical first grade packout (%)</b>	53.0	66.0	55.0	70.0	67.5	80.0	80.0	75.0	50.0	67.5	70.0	N/A	80.0

<sup>1</sup>area is estimated using 0.8 ha for data in the <1 ha category and 20 ha for data in the 16+ ha category.

<sup>2</sup>HCS = high colour strain.

## Using protective netting

To determine the type of protective netting systems being used in NSW, the survey asked respondents if they used netting and to specify the type of netting used. Results showed an even split between structured and throwover netting, with some growers using a mixture of both types. Twelve per cent of growers surveyed are not using any type of protective netting in their orchard (Figure 8).

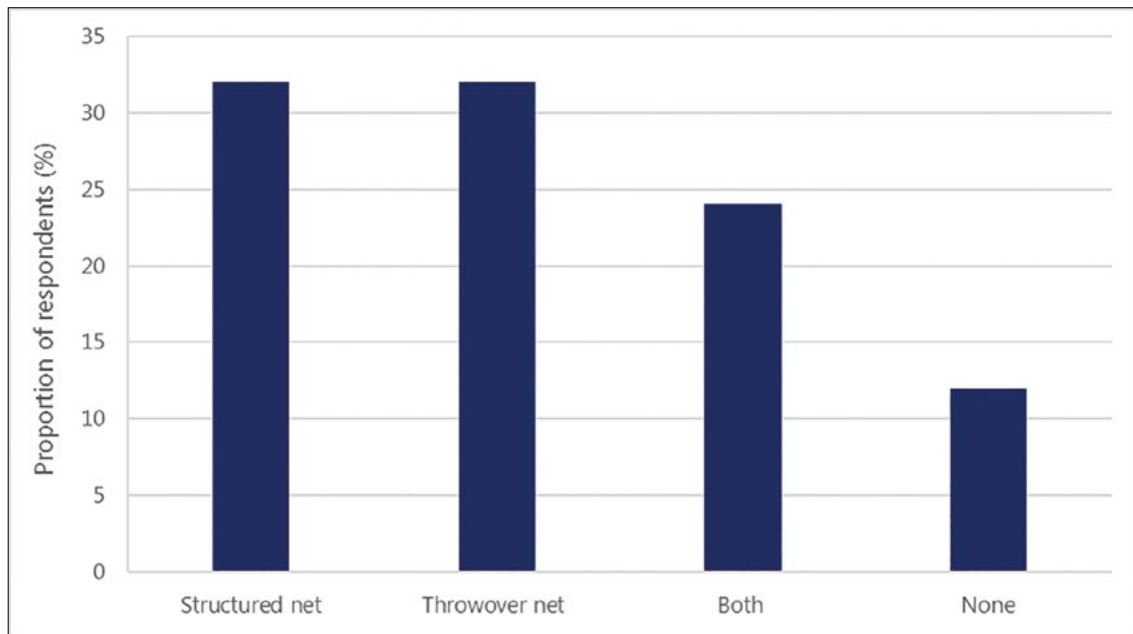


Figure 8. Type of netting used in respondent's apple orchards.

## Irrigation methods

The most common type of irrigation in NSW is drip irrigation, used by 63% of growers (Figure 9). Of the growers surveyed, none reported using overhead sprinklers.

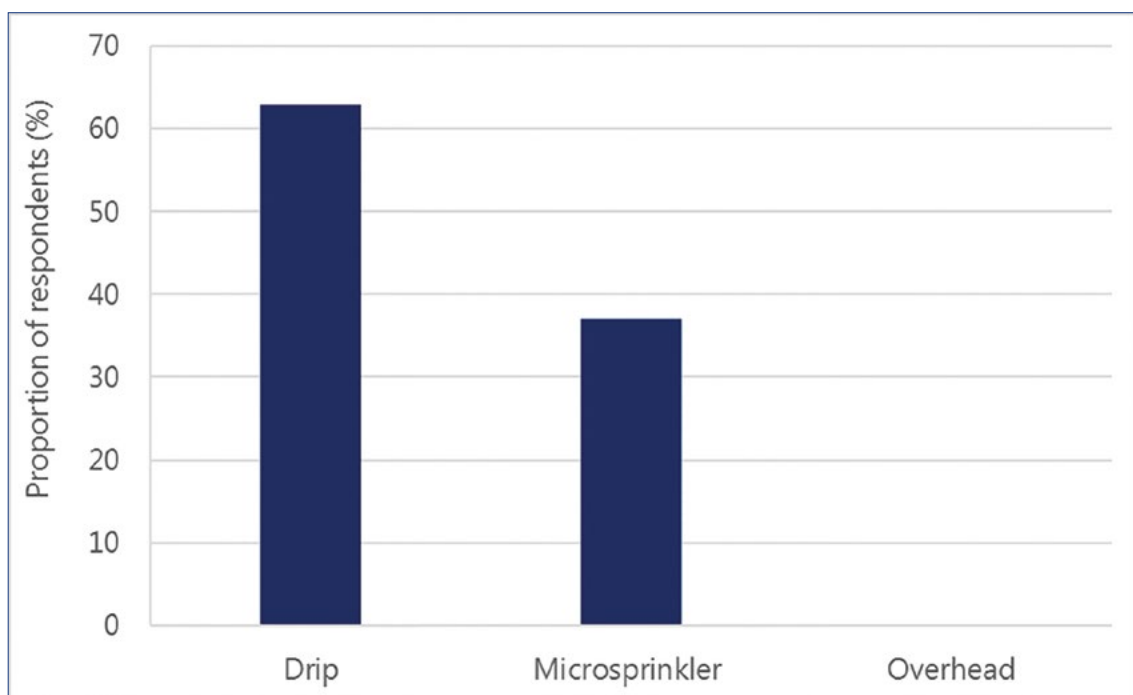


Figure 9. Type of irrigation used in respondent's apple orchards.

## Labour-saving technologies

Mechanical thinning, mechanical pruning, packhouse automation and motorised platforms are the most commonly used labour-saving technologies in orchards. Motorised platforms were the most common type (35%) of technology used in NSW apple orchards, followed by mechanical pruning (28.5%) and packhouse automation (28.5%). None of the respondents reported using mechanical harvesting (Figure 10).

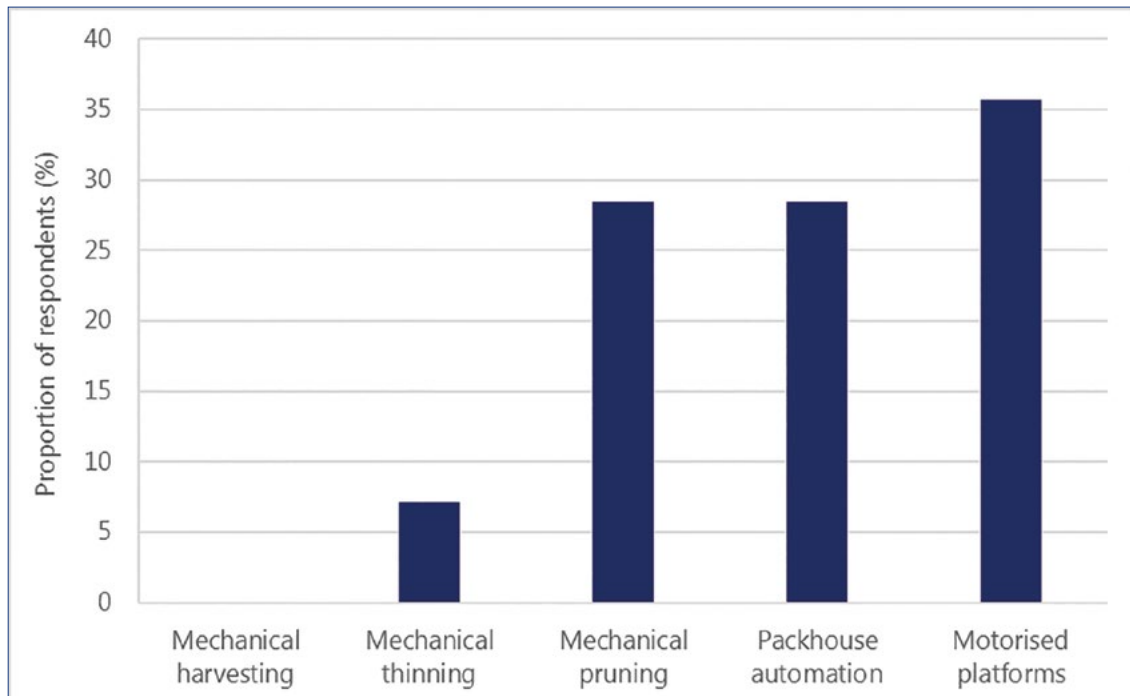


Figure 10. Labour-saving technologies used in respondent's apple orchards.

Respondents were asked to select the likeliness of adopting robotics to replace labour. The most common response was 'unlikely', followed by 'not sure', 'likely', and 'extremely unlikely' (Figure 11). No respondents indicated that they were 'extremely likely' to adopt robotics to replace labour.

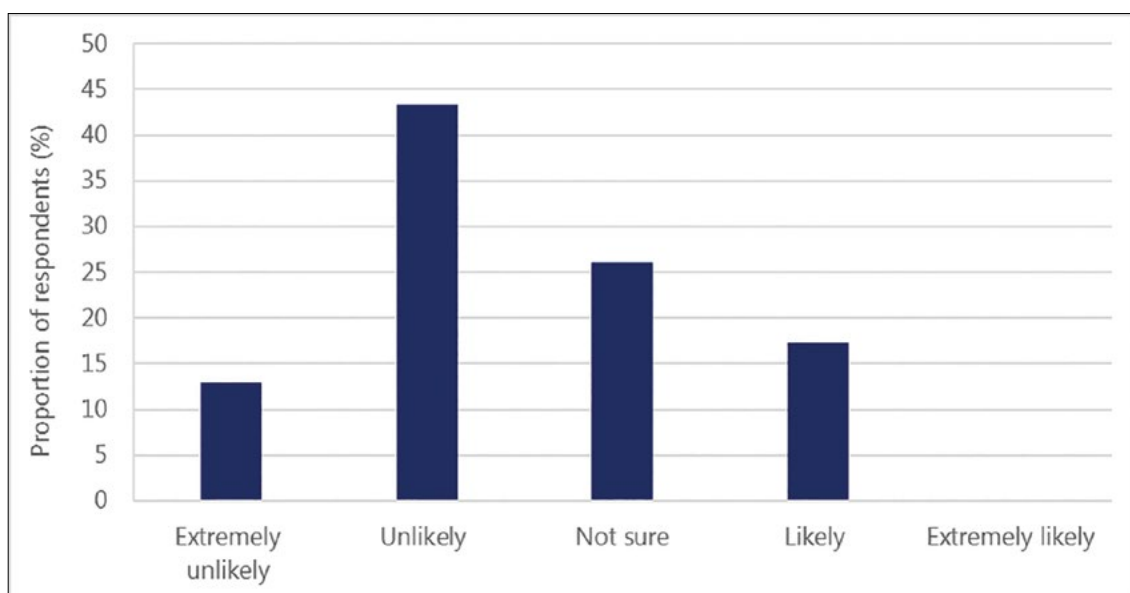


Figure 11. Likelihood of growers adopting labour-saving technology.

## Employment statistics

Seventy-six full-time employees, 174 part-time employees (<30 hours/week) and 831 casual employees were recorded as employed by the survey respondents. On average, each orchard had 3 full-time employees and 10 part-time employees (Table 2). The majority of staff are employed during picking (Table 3).

Table 2. The number of full-time and part-time staff employed in respondents' apple orchards.

	Full-time	Part-time
Total (across all orchards)	76	174
Average (per orchard)	3	10

Table 3. The number of casual employees in respondents' apple orchards.

	Pruning	Thinning	Picking	Packing
Total (across all orchards)	82	211	367	171
Average (per orchard)	7	14	25	19

## Facilities on farm

Just over half (56.5%) of the respondents have a cool storage facility on farm (Figure 12) and the same number have a packhouse on farm (Figure 13). When asked what capacity the cool store facilities held, responses ranged from 20 to 50,000 bins. The majority (62%) of respondents said their packhouse was for personal use only.

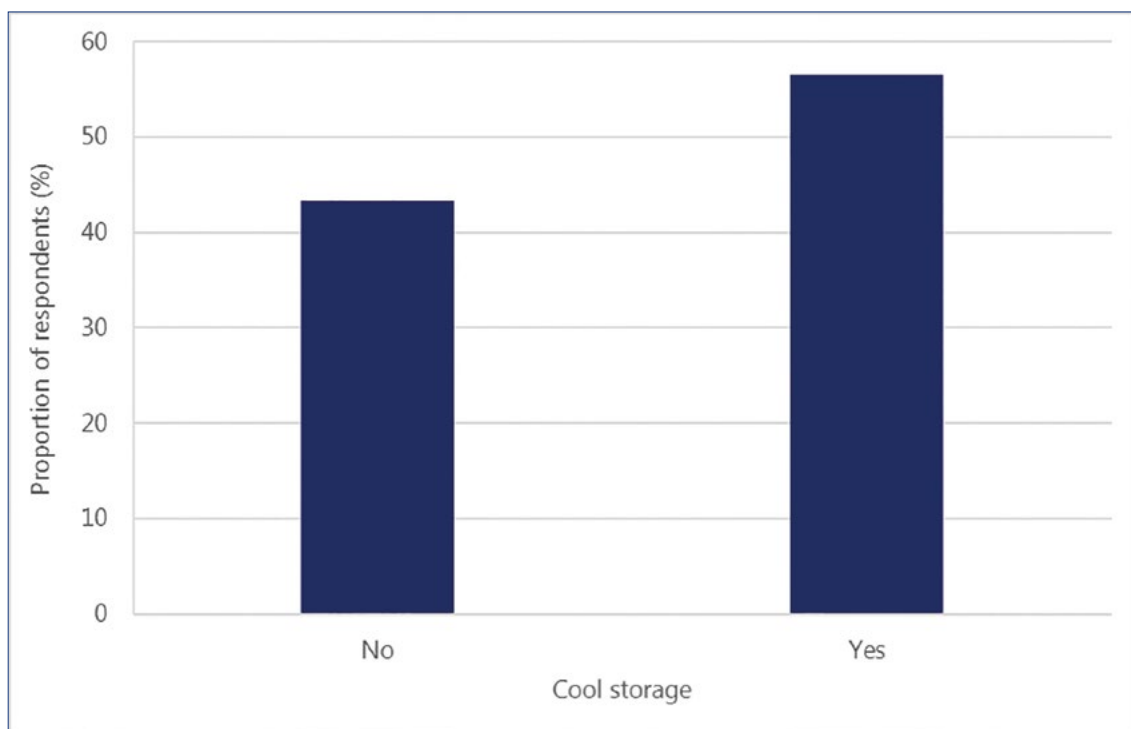


Figure 12. Proportion of respondents with access to cold storage on farm.

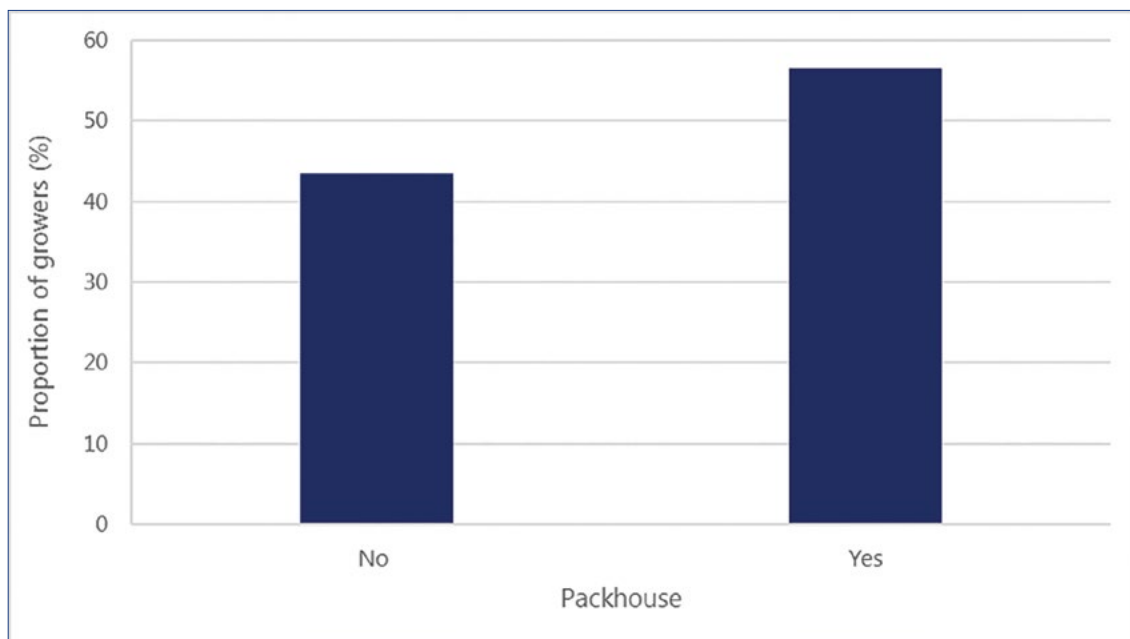


Figure 13. Proportion of respondents with access to a packhouse facility on farm.

### Processed products and value-adding

When asked what type of value-add products growers are producing, juice was the most common (55%), followed by cider (28%), vinegar (9%), dried fruit (5%) and apple pies (5%, Figure 14).

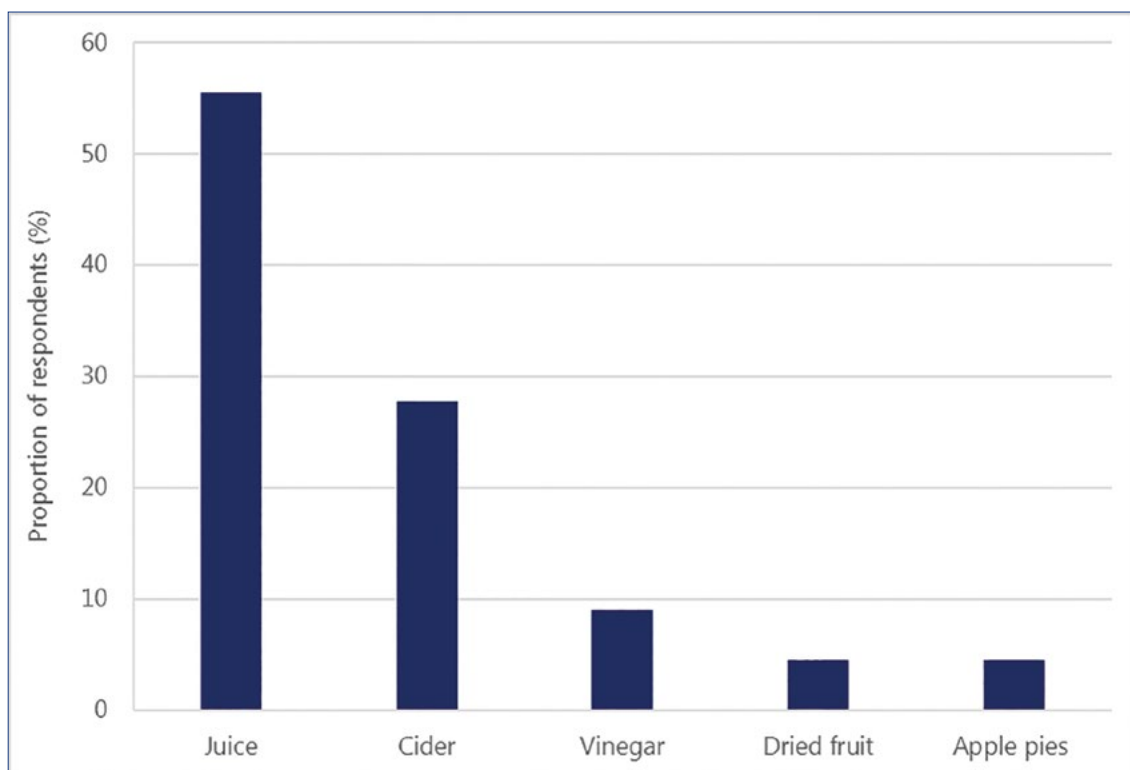


Figure 14. Value-add products produced by surveyed apple growers.



## Markets

The majority of respondents sell their fruit through wholesale markets (76%). Only 2% send their produce to international markets (Table 4).

Table 4. The proportion of respondents and the different markets they are using to sell their produce.

Type of market	Proportion of respondents (%)
Direct	36.3
International	2.0
Processing	23.3
Roadside	48.8
Wholesale	76.1

To gauge the level of interest in exporting apples, we asked if the respondents would be interested in attending workshops about expanding the export market for apples; 34.5% indicated they would be interested (Figure 15).

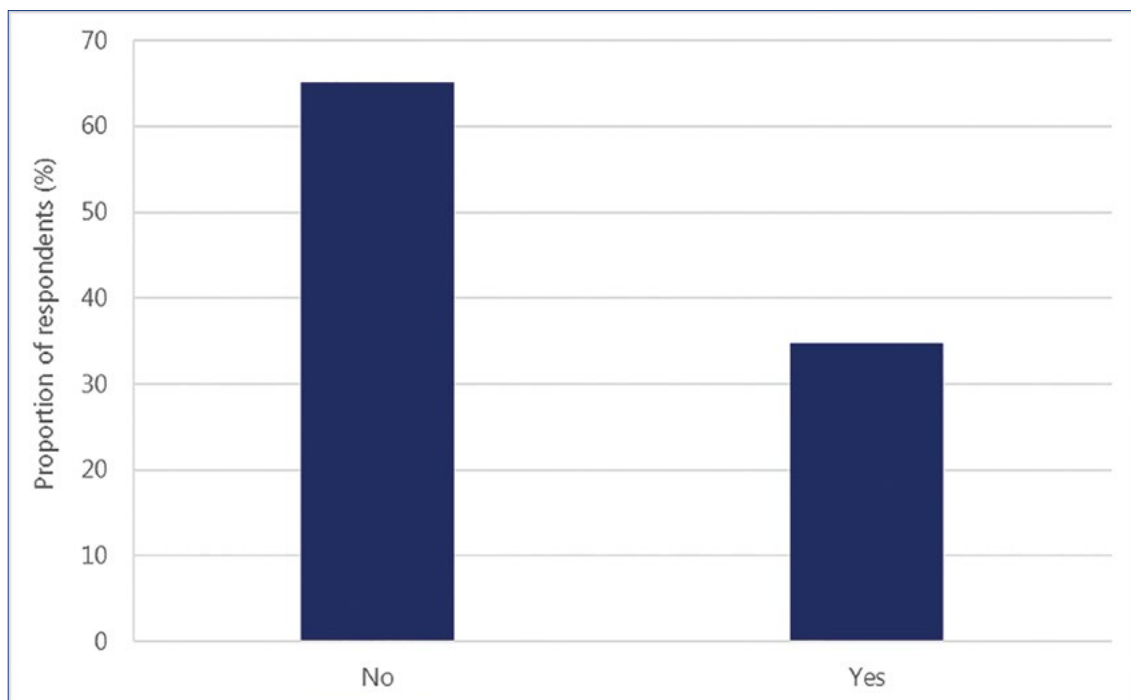


Figure 15. Proportion of respondents interested in exploring export opportunities.

## Marketing

Seventy-four per cent of orchardists are marketing their own product (Figure 16) and are using a range of options (Table 5).

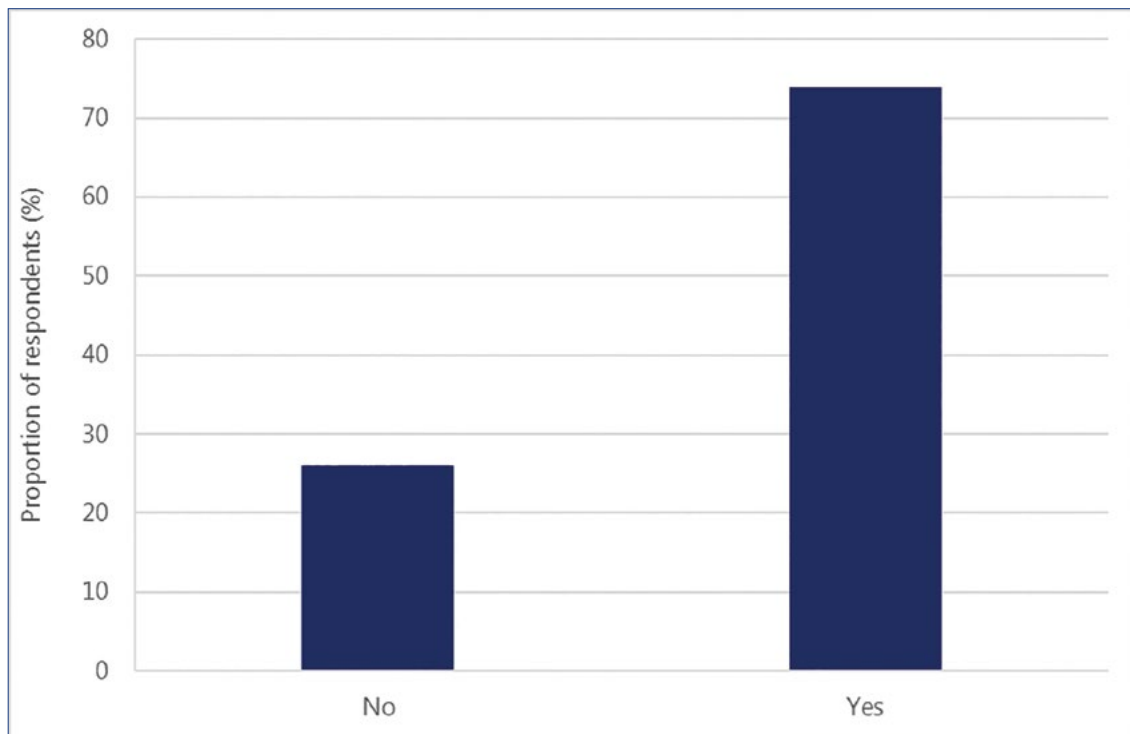


Figure 16. Proportion of respondents who are marketing their own product.

Table 5. Types of marketing used by orchardists.

Type of market	Proportion of respondents (%)
Farmers markets	27.7
Personal contacts	11.1
Pick your own	22.2
Roadside and shed stalls	22.2
Social media	16.6

## Challenges

Survey respondents were asked to list the biggest challenges they see affecting the production and sustainability of the NSW apple industry. This list was then displayed in a word cloud, with constraints that are more common appearing bigger in the cloud (Figure 17).



Figure 17. Challenges to the apple industry as indicated by survey respondents.

Labour (referring to the cost as well as source), profit and over-supply were identified as the biggest constraints to the industry. Respondents were then asked what they identified to be the biggest constraint to their personal orchard (Figure 18). Again, labour and income appear to be the biggest constraints to growers personally, with the changes in climate and weather patterns becoming more prevalent.



Figure 18. Challenges to individual orchards as indicated by survey respondents.

## Targeted areas for research and development

The NSW DPI Development Officers for Temperate Fruits are employed to assist and develop the NSW apple industry through research, development and extension. To help identify the areas in which the industry would like more investment, respondents were asked to highlight different categories. New IPM strategies were identified as the most important (25.5%), followed by labour-saving robotics (17%) along with soil and plant nutrition (15%). Interestingly, areas currently attracting research such as plant growth regulation, rootstocks, thinning techniques and development of low chill varieties were identified as the least important (Figure 19).

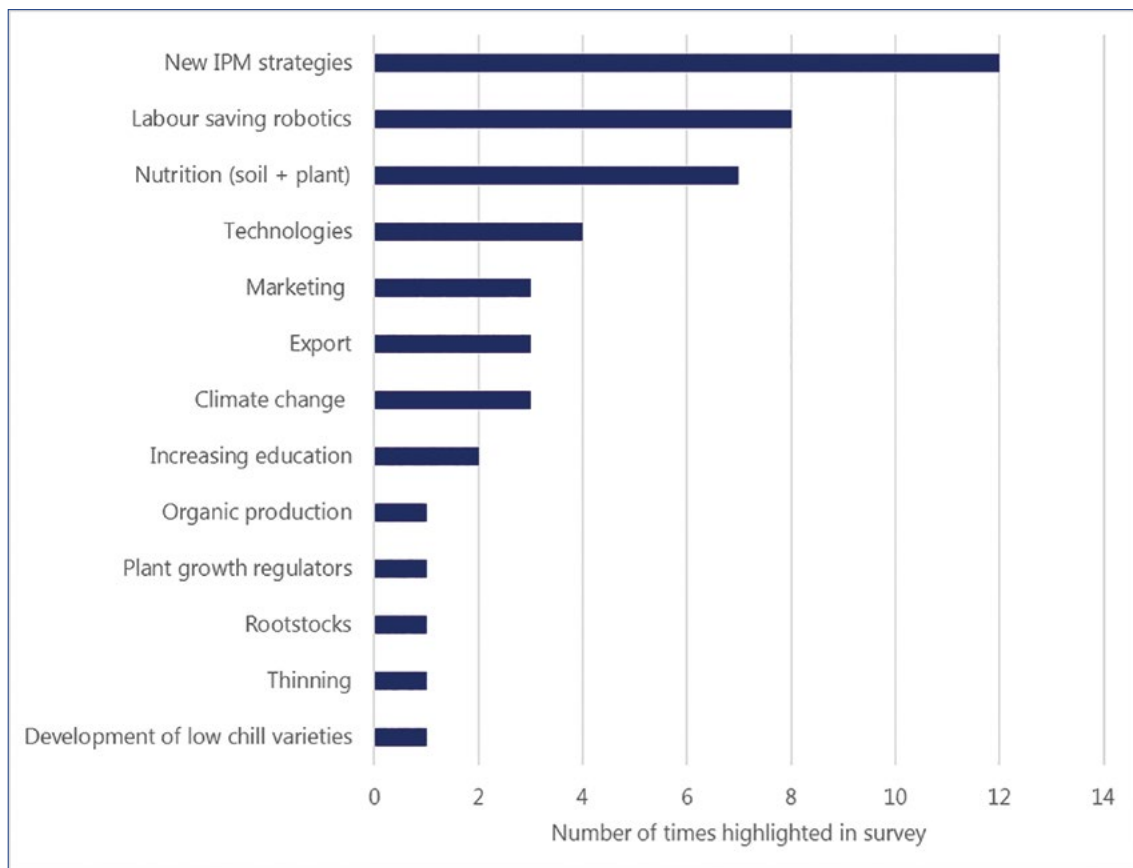


Figure 19. Areas identified by respondents to receive further research.

When asked what the growers planned to change in the future, the most common response was machinery (17%), followed by retirement (14%), labour organisation (12.5%), succession planning and farm size (10.5%), planting systems and alternate earnings (9%) (Figure 20). Interestingly, buildings and focusing on other crops such as cherries were the lowest rated (3.5%) responses.

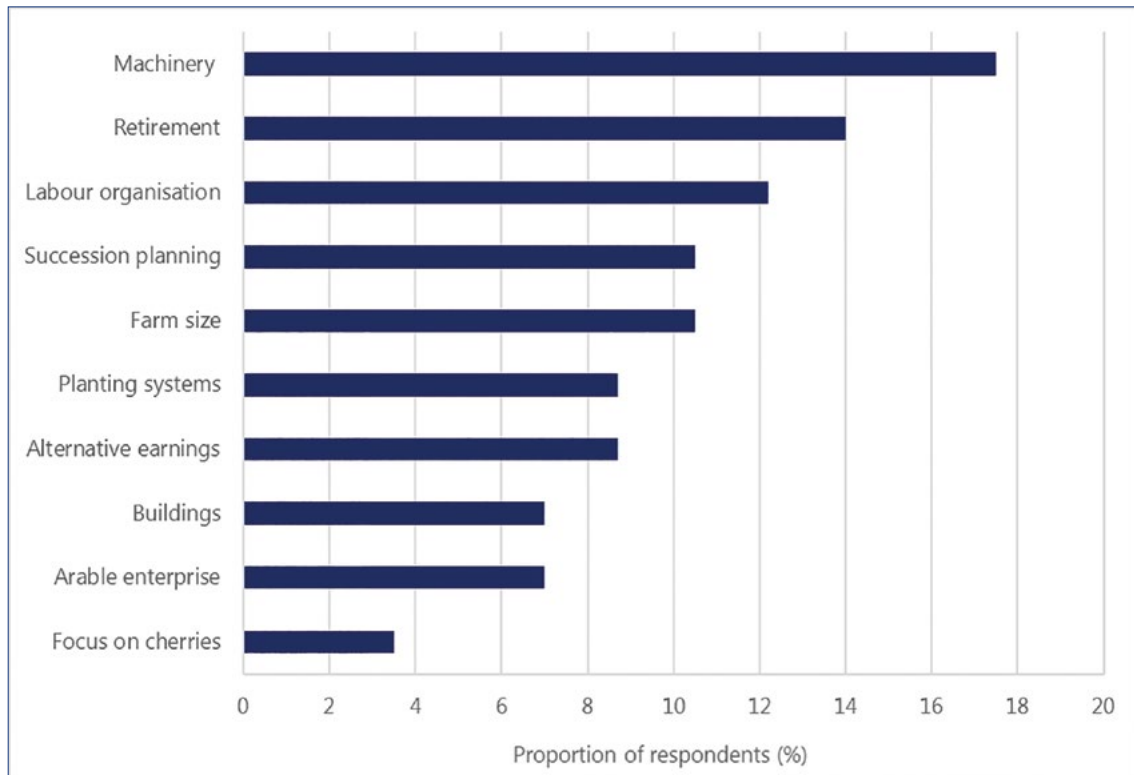


Figure 20. Respondents intended plans for changing.

Growers were asked if they intended to increase, maintain or decrease their plantings in the future. The number of growers maintaining (54.4%) or increasing (31.8%) their apple plantings outweighed the number of growers reducing (13.6%) their plantings (Figure 21).

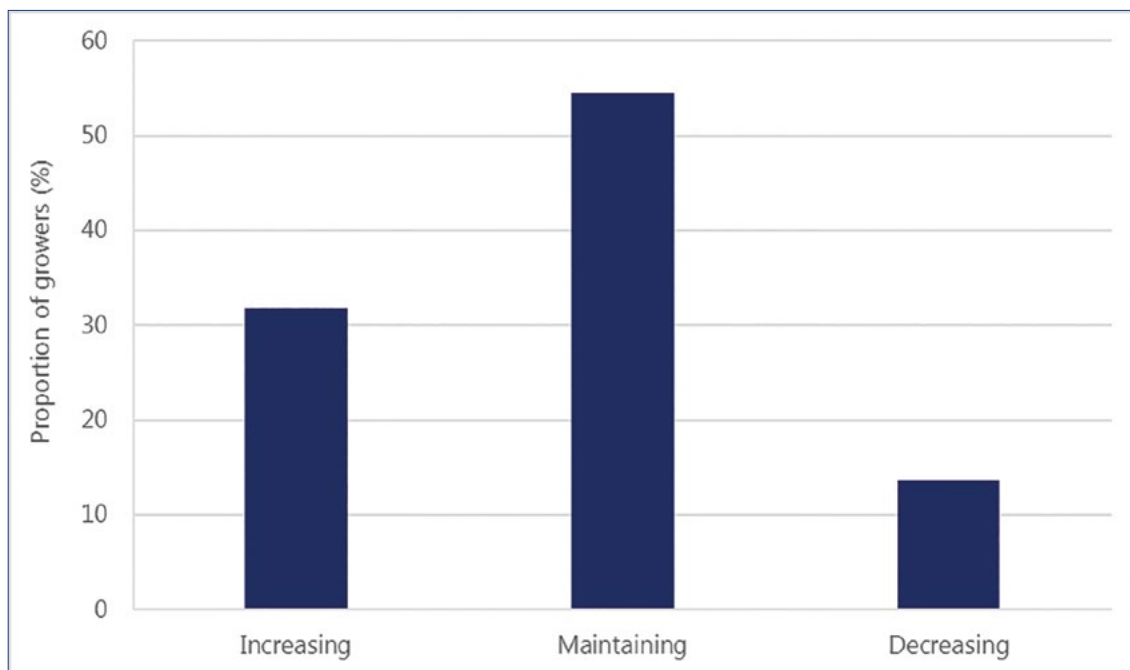


Figure 21. Respondent's apple planting intentions.

### Information sources

Respondents indicated that Apple and Pear Australia Limited (APAL) and NSW DPI publications were the most popular places growers' sourced information for crop production (Figure 22). Their own research was the least common method used to get information.

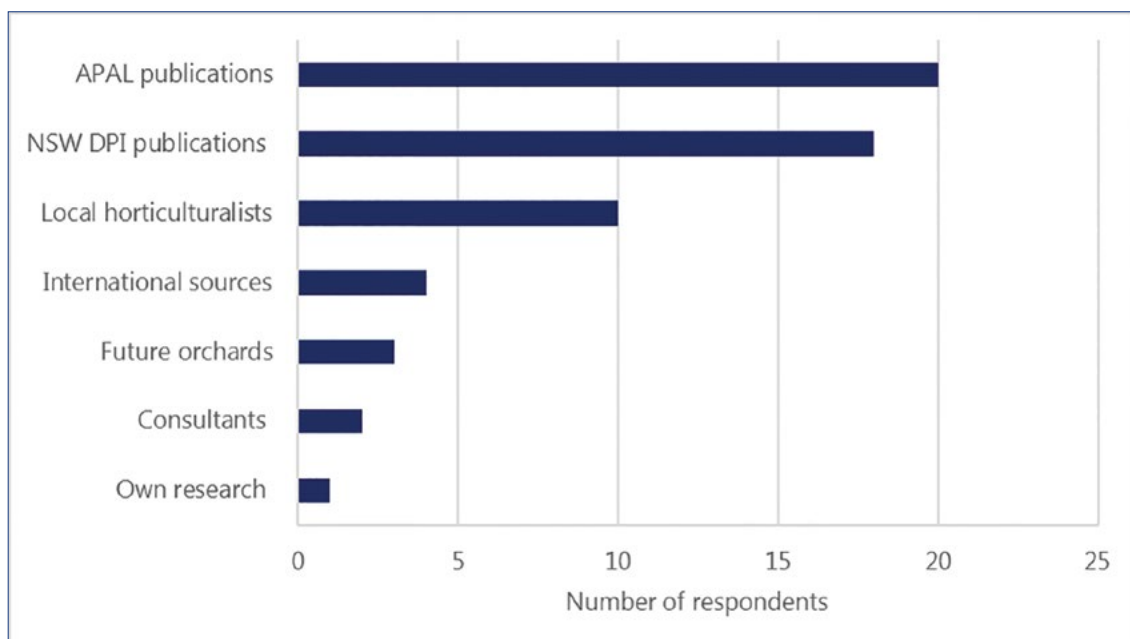


Figure 22. Most common sources of information for respondents.



## Discussion

Having baseline data that reflects the current position of the NSW apple industry will give a clearly defined starting point for future work. It will also provide a reference point from which to measure and compare the outcomes of future projects. This survey was designed to provide insight into the areas requiring more research and development to enhance sustainable and profitable production. The results give a snapshot of the NSW apple industry and can be used to tailor the direction of the work of NSW DPI Development Officers.

Anecdotal evidence suggests there are 56 apple growers in NSW with the major growing centres being in the Batlow and Orange regions. The response rate from the Bilpin region was disproportionately high given the small number of growers in this area compared to the major centres. However, this is consistent with the recent high attendance rates by growers from the Bilpin and Sydney Basin areas at industry events including the Future Orchards walks at Orange. This could be a reflection of increasing grower engagement in industry level activities and presents an opportunity for another area of focused research and development. The relatively low response rate from the larger growing districts might indicate a need for some focus to be placed on strategies that build grower engagement and participation in these regions.

The disproportionately high response rate from the smaller and largely farm gate focused Bilpin district could have influenced the distribution of orchard size data in this survey. The high number of respondents having between 1 and 10 hectares could reflect the resurgence of consumer interest in buying fruit and other value-added products directly from the farmer. The smaller orchards are often grown for 'pick your own' or roadside stalls. This seems to be underpinning a new period of financial sustainability for small farm gate orchards, which are an increasingly important part of the NSW apple industry.

The survey provided an indication of the current age profile of growers in the apple industry. The small number of growers under the age of 45 years indicates the need for more intervention to encourage young people into the NSW apple industry. Groups such as the APAL Young Members' Network will help build the age profile of the industry whilst also investing in the leadership, networking and career growth opportunities for the younger generations (Apple and Pear Australia Limited, 2019b). It should be noted that the survey only asked for the age of the respondent, not all employees of the business. Therefore, the age distribution data might not be completely indicative of the entire NSW apple industry.

The data show a low number of women in the NSW apple industry, however, this survey did not explore the husband and wife partnerships nor family partnerships, therefore women might be under-represented. In many cases women manage the bookwork and other administrative aspects of the business and may be more involved in the business than suggested in these results. The low number of women could also be an opportunity to encourage more women into the industry or take on more of a role in the production side of the business.

Interestingly, a majority of respondents were first or second generation farmers, challenging the perception that orchards have been handed down through multiple generations. This could suggest that people are confident to enter the industry without prior experience, which could increase the confidence of others wishing to

enter the industry. Conversely, succession planning ranked as one of the top four items for growers to change, potentially indicating that growers want to pass their orchards on after retirement. This could also see some young orchardists entering the industry, a positive change that is needed for the industry to remain viable.

A concern for the apple industry is the intention of some NSW apple growers to increase the proportion of cherry plantings in their orchards until their apple plantings become minimal. The climatic and soil characteristics of the key NSW apple growing regions (Batlow and Orange) also favour the production of high quality cherries. When the apple industry is struggling, some growers may look to cherries as an alternative to apples. Whilst there has been some increase in cherry production in the Orange region in recent years, 88% of respondents indicated that apples are still the main enterprise. However, 54% of respondents indicated that they are intending to increase their cherry plantings, which could highlight a need for increased investment in cherry research, development and extension for these growers.

Oversupply in the domestic apple market does not provide sufficient returns to keep growers in the industry. Coupled with consumption declining at 3% per annum due to competition from other snack foods, other markets must open (Apple and Pear Australia Limited, 2015). Our survey showed that only 2% of respondents are currently using international markets to sell their fruit, however 34.5% are interested in learning more about export markets. Expanding the markets to which apple growers send their fruit may reduce pressure on the domestic market, potentially returning better profit margins for the grower. Australia's competitive edge largely remains with premium products and niche markets. Unfortunately our global competitiveness is challenged by our rank as the highest cost producer in the world, thus reducing production costs is crucial if the industry is to move to international markets.

The data on apple variety plantings in NSW is a valuable dataset that was previously missing. However, it is important to note that the survey did not capture the actual area of production due to a low response rate, regardless, these results can be used as a guide. Recently across many Australian growing regions, traditional apple cultivars such as Sundowner, Golden Delicious and Red Delicious continue to be replaced by many new licensed cultivars such as Nicoter (marketed as Kanzi™), Jazz™, high-coloured strains of Cripps Pink (Pink Lady™) and Gala. In NSW, the most common types planted are Cripps Pink high colour strain varieties (86.6 ha) and this is consistent with the current national plantings (Hort Innovation 2017). While Granny Smith is the second largest planting nationally (Hort Innovation, 2017), our survey indicated that in NSW, Gala varieties are the second most popular (Figure 23). The low numbers of Jazz™ and Bravo™ could be due to the age of the trees in these varieties. Many of these varieties are not at full production yet, therefore the potential yield is not truly captured.

In a recent benchmarking study undertaken by APAL on 26 businesses, an average yield was noted to be 47.9 t/ha. According to our survey data, Cripps Pink high colour strain, Nicoter and Red Delicious are all yielding higher than average while Jazz™, Granny Smith and Sundowner varieties are yielding below average. The Apple and Pear Strategic Investment Plan (Hort Innovation, 2017) outlines the key influences of yield are planting density, variety, soil health, netting, age of trees,

pest and disease interactions, water management and fertiliser management. Evidently these areas could benefit from targeted research and development to help growers improve the yields of under performing varieties and orchards.

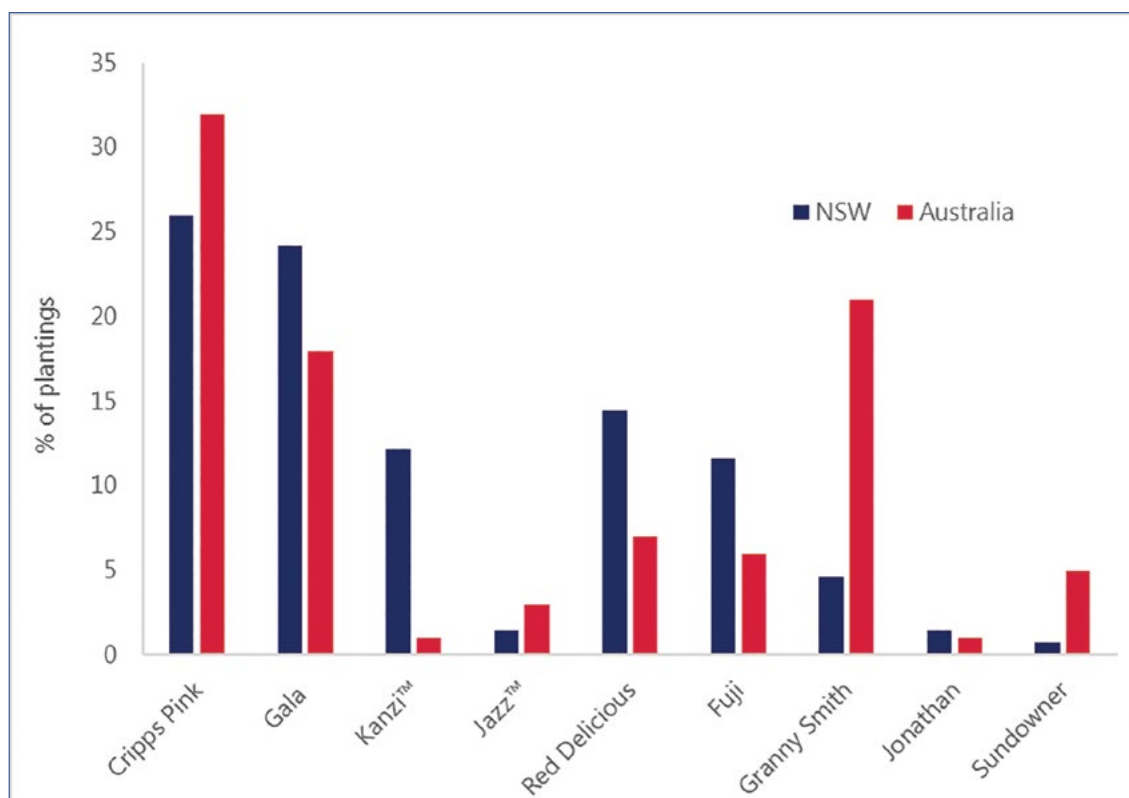


Figure 23. Percentage of total area of varieties planted across apple orchards in NSW and Australia (Hort Innovation, 2017).

One management strategy gaining popularity for optimising yield is netting. Protected netting mitigates risk against hail damage, sunburn, flying fox and bird damage (Mupambi *et al.*, 2018). The high number of growers who responded with 'Yes' to using protective netting reflects the need for growers to protect crops and their desire to enhance fruit quality. With climatic pressures and drier conditions expected to continue, protective netting offers growers an additional way of influencing their fruit quality. There are two main types of protective netting used in orchards; structured netting and throwover netting. The type of netting used will be influenced by the ease with which growers can still apply management practices under or through the netting. In this survey, equal numbers of orchardists are using both types of netting. However, it is speculated that growers would prefer to have structured netting, but are limited due to financial constraints.

The dry conditions experienced in recent decades across southern Australia are the most sustained large-scale changes in rainfall seen since 1999 (CSIRO, 2018). Likewise, the south-east of Australia experienced an 11% decrease in rainfall from April to October (CSIRO, 2018). If the dryer conditions continue, water management is a key issue in NSW apple orchards and orchardists need to adopt efficient water management strategies. Access to irrigation can offer growers the opportunity to increase yields and productivity, especially during periods of low rainfall. Irrigation can also enable better nutrient use efficiency through fertigation. Factors such

as soil type, crop type, planting density, water quality, irrigation equipment and economic factors such as capital and operating costs, will influence the type of irrigation system a grower will invest in for their orchard (Jerie and Adem, 2010). The survey showed that the most common type of irrigation used in NSW is drip irrigation. This system is suited to the smaller root zones of the modern day dwarfing rootstocks. It delivers water precisely, ensuring that no resources are wasted (Netafim, 2018). Soil moisture monitoring is now more critical than ever. It indicates what is happening at specific locations so data can be combined with water budgets to accurately apply the correct amount of water the tree requires (Apple and Pear Australia Limited, 2015). This is useful when prolonged dry conditions reduce water availability.

The Apple and Pear Strategic Investment Plan (Hort Innovation, 2017) outlined the key labour issues being the award rate, the backpacker tax, labour add-on costs, availability, penalty rates and skills levels. Implementing labour-saving technologies is one way orchardists can remain viable and competitive with other food producers. The most common technology used in orchards is motorised platforms, which help reduce the time employees spend climbing ladders. However, the high number of responses in the “extremely unlikely” and “unlikely” to adopt technology in the orchard categories may be a reflection of the lack of hard evidence of suitable machines available for the grower’s orchard. There could also be a cost concern associated with the implementation of labour-saving technologies in orchards. More research and development into reducing the cost of labour-saving technologies and making them more accessible to growers is crucial.

Apples are available year round in Australia through the use of controlled atmosphere cold storage technology. Australian apple growers will store fruit to ensure it maintains maximum sweetness and crispness. With some apples, the flavour can improve after a few months’ storage because the natural acid composition changes, making them slightly sweeter (Apple Pear Australia Limited, 2019a). With the ability to store fruit for longer periods and the incidence of oversupply in the domestic market increasing, apple value-add products are now becoming more popular. These products can include juice, cider, sparkling juice, jams, dried products, vinegar, purees and baby foods. Juice and cider production were the most common (55% and 28% respectively) value-added products growers use to sell their fruit. Commonly, apples are juiced because they are not suitable for the fresh market due to not meeting market specification. Further research into juice and cider production may be beneficial to ensure premium returns to the grower.

## Conclusions

The information in this report provides a snapshot of a portion of the NSW apple industry in 2019. To ensure the future prosperity of the NSW apple industry, research and development should focus on:

- building grower engagement in the major apple growing regions
- encouraging younger growers and female growers to enter the industry
- reducing costs, particularly labour costs
- improving yield, especially of varieties that perform under the national average
- irrigation strategies, including technology to measure water use efficiency

- new marketing opportunities, including international markets and business skills for marketing.

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# Appendix 1



Department of  
Primary Industries

## NSW apple industry baseline survey 2019

### You and your orchard

This survey is part of a NSW Department of Primary Industries project designed to identify which areas of the NSW Apple Industry require research and development. Data generated from this survey will also help the NSW apple industry with development plans.

If you are a farmer currently growing apples in NSW we need your ideas and expertise. Please take part in our survey so you can contribute to the future direction of research and development of your industry!

If you have any questions about the survey please contact Jessica Fearnley on 0437 284 010 or email at [jessica.fearnley@dpi.nsw.gov.au](mailto:jessica.fearnley@dpi.nsw.gov.au) (Orange) or Kevin Dodds on 0427 918 315 or email at [kevin.dodds@dpi.nsw.gov.au](mailto:kevin.dodds@dpi.nsw.gov.au) (Tumut).

Your responses will remain confidential and the more detail you can provide, the more useful the results will be.

This survey will take approximately 10 minutes to complete.

Complete before midnight 25th August 2019 for a chance to win a GDot soil moisture sensor valued at \$290!

### Terms and conditions

The chance draw is open to people aged 18 and over who provide their email address at the end of the survey. The closing date of the chance draw is 23:59 on Sunday the 25th of August 2019. Entries received outside this time period will not be included. One winner will be chosen from a random draw of entries received in accordance with the terms and conditions. The draw will be performed by a random computer process. The draw will be conducted at 9 am Monday the 26th of August 2019. The winner will receive an MEA GDot Soil Moisture Tension Display, 1 Gypsum Block soil moisture sensor with 2 metres of cable, 2 'AA' batteries, pre-installed, screws and cable ties to mount the GDot and sand/bentonite mix for installation. The winner will be notified by email on the 27th of August 2019 and must provide an email address to claim their prize. If a winner does not respond within 14 days of being notified by the Department, then the winner's prize will be forfeited and the Department shall be entitled to select another winner in accordance with the process described above (and that winner will have to respond to notification of their win within 14 days or else they will also forfeit their prize). If a winner rejects their prize or the entry is invalid or in breach of these terms and conditions, the winner's prize will be forfeited and the Department shall be entitled to select another winner. The prize will be sent to the winner by the Department. The prize is non-exchangeable, non-transferable, and is not redeemable for cash or other prizes. The winner's name will be sent out to all participants of the survey via email.

## Privacy statement

This is a voluntary survey. The information will be used by the NSW Department of Primary Industries as part of its reporting requirements and to inform future projects and support services. The data will be used solely for the purpose for which they have been collected and we will ensure that the data is stored securely, with appropriate security safeguards.

### \* 1. Do you accept the terms and conditions?

☐ Yes

### 2. What region is your orchard located in?

☐ Orange

☐ Batlow

☐ Bilpin

☐ Sydney Basin

☐ Other (please specify)

### 3. What is your age?

☐ Under 18

☐ 19-25

☐ 26-35

☐ 36-45

☐ 46-55

☐ 56-65

☐ 66-75

☐ 76-85

☐ 86+



**4. What is your gender?**

- ☐ Male
- ☐ Female
- ☐ Other
- ☐ Rather not say

**5. What generation farmer are you?**

- ☐ 1st Generation
- ☐ 2nd Generation
- ☐ 3rd Generation
- ☐ 4th Generation
- ☐ 5th Generation
- ☐ >6th Generation

**6. Size of productive orchard (in hectares)**

**7. How many orchards have been amalgamated with the original orchard?**

- ☐ None
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ > 4
- ☐ Other (please specify)

**8. Are apples the main agricultural practice in your business?**

- ☐ Yes
- ☐ If no, what is?

**9. What is the ratio of apples to your other enterprise?**

10. If applicable, what best describes your future planted area for cherries?

- ☐ Increasing
- ☐ Maintaining
- ☐ Decreasing
- ☐ Not applicable

11. What are the current varieties you are growing in your orchard and how many acres or hectares do you grow of each variety (choose either acres or hectares)

	Hectares	Typical yield (t/ha)	Typical first grade packout (%)
Pink Lady Ordinary Strain	<input type="text"/>	<input type="text"/>	<input type="text"/>
Pink Lady High Colour Strain	<input type="text"/>	<input type="text"/>	<input type="text"/>
Gala Ordinary Strain	<input type="text"/>	<input type="text"/>	<input type="text"/>
Gala High Colour Strain	<input type="text"/>	<input type="text"/>	<input type="text"/>
Kanzi	<input type="text"/>	<input type="text"/>	<input type="text"/>
Jazz	<input type="text"/>	<input type="text"/>	<input type="text"/>
Bravo	<input type="text"/>	<input type="text"/>	<input type="text"/>
Red Delicious	<input type="text"/>	<input type="text"/>	<input type="text"/>
Fuji	<input type="text"/>	<input type="text"/>	<input type="text"/>
Granny Smith	<input type="text"/>	<input type="text"/>	<input type="text"/>
Jonathans	<input type="text"/>	<input type="text"/>	<input type="text"/>
Braeburn	<input type="text"/>	<input type="text"/>	<input type="text"/>
Sundowner	<input type="text"/>	<input type="text"/>	<input type="text"/>

Other (please specify)

12. Do you use netting in your orchard?

- ☐ No
- ☐ If yes, is it structured or drape?

13. What percentage of your orchard is covered by net?



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## NSW apple industry baseline survey 2019

### Management practices

14. What percentage of your orchard is free standing or trellised?

Free standing

Trellised

15. What is your current irrigation method? (Tick all that apply)

☐

Drip

☐

Overhead

☐

Microsprinkler

☐

Other (please specify)

16. Do you use nutrient budgeting?

☐

Yes

☐

No

**Do you use any of the following labour saving technology? (Tick all that apply)**

No

Mechanical pruning

Mechanical thinning

Motorised platforms

Mechanical harvesting

Packhouse automation

Other (please specify)

**How likely are you to use robotics to replace labour in the next 5 years?**

Extremely unlikely

Unlikely

Not sure

Likely

Extremely likely

**How many full time staff do you have? (Please include yourself and any family members that fall under this category)**

**How many part-time staff do you have? (Please include any family members that may fall under this category)**

**How many casual staff do you employ over a year on the following tasks?**

ing

ning

ng

ing



## NSW apple industry baseline survey 2019

### Postharvest and Marketing

**22. Do you have your own cool storage facility?**

- ☐ No
- ☐ If yes, what capacity (bins/tonnes)

**23. Do you have your own packhouse?**

- ☐ No
- ☐ If yes, do you pack fruit for yourself only or others?

**24. Are you a member of any co-operatives? (Tick all that apply)**

- ☐ Farming co-operatives
- ☐ Storage co-operatives
- ☐ Packing co-operatives
- ☐ Marketing co-operatives
- ☐ No, I am not a member of any co-operatives
- ☐ Other (please specify)

**25. Are any of your apples processed?**

- ☐ No
- ☐ If yes, what value added products do you produce?

**26. What percentage of your final yield goes to:**

Roadside markets?	<input type="text"/>
Direct markets?	<input type="text"/>
Wholesale markets?	<input type="text"/>
International markets?	<input type="text"/>
Processing?	<input type="text"/>

**27. Are you currently marketing your own produce?**

☐ No

☐ If yes, how?

**28. Would you be interested in attending workshops about expanding the export market for apples?  
These workshops may include delegate opportunities, preparing your orchard for export and  
potential markets that may be right for your product**

☐ Yes

☐ No



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NSW apple industry baseline survey 2019

**Research and development**

**29. What do you see to be the biggest constraint to the NSW apple industry in your region?**

**30. What do you see as your greatest challenge for your orchard to thrive?**

31. In what areas would you like to see more research and development? (e.g. soil nutrition, post harvest technologies)

1	<input type="text"/>
2	<input type="text"/>
3	<input type="text"/>
4	<input type="text"/>
5	<input type="text"/>



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## NSW apple industry baseline survey 2019

### Future intentions

32. Do you have any firm plans to change any of the following in 5 years? (Tick all that apply)

- ☐ Farm size
- ☐ Labour organisation
- ☐ Arable enterprise
- ☐ Buildings
- ☐ Machinery
- ☐ Retirement
- ☐ Succession planning
- ☐ Alternative earnings
- ☐ Other (please specify)

33. What are your apple tree planting intentions for the future?

- ☐ Increasing
- ☐ Maintaining
- ☐ Decreasing





NSW apple industry baseline survey 2019

Information sources

**34. Where do you source information on production methods? (Tick all that apply)**

- ☐ DPI
- ☐ APAL publications
- ☐ Local horticulturists
- ☐ Other (please specify)

**35. How do you prefer to be contacted by the DPI? (Tick all that apply)**

- ☐ Email
- ☐ Phone call
- ☐ SMS
- ☐ Social media (ie. Facebook groups, Twitter)
- ☐ Local merchants and co-operatives
- ☐ Other (please specify)

**36. If you would like a copy of the survey results please provide your email address. (You must provide email address if you wish to enter the prize draw)**