GIPPYAg STEM, Food & Fibre Teacher Professional Development Workshops

HIGHLIGHTS

Twenty-eight teachers registered to attend a series of 1-day STEM, Food and Fibre Teacher Professional Development Workshops in Term 4 at Morwell, Leongatha and Bairnsdale. The workshops opened with a presentation on the agricultural and horticultural industry including its contribution to the economy, case studies of Gippsland food and fibre businesses and career opportunities.

Teachers then participated in two hands-on workshops – Sweet Science and Digital Farm Mapping. One of the highlights of the workshop was a presentation by an industry leader who shared information with participants about their business and how they tackle social, economic and environmental issues whilst answering questions about job opportunities and the skills they desire in their employees. Teachers who attended rated the overall experience as 4.7 out of 5 and all would recommend the workshop to their colleagues.

PROJECT OBJECTIVE

To increase the knowledge and skills of Gippsland teachers to allow them to confidently incorporate food and fibre concepts into their teaching program. The aim of this case study was to obtain some background information about teachers' knowledge and perception of the agricultural industry, their desire to increase food and fibre concepts in the classroom and the resources they need to do so. Additionally, this case study reports the results of the post-workshop survey identifying whether the event both engaged and increased the knowledge of teachers in food and fibre lessons.

BACKGROUND

Teachers are key influencers in a student's life not only in passing on knowledge and skills but supporting and inspiring career aspirations. It was therefore important to the overall GIPPYAg project objective that a workshop was specifically designed to engage and build capacity of Gippsland primary and secondary school teachers. Whilst there is a need for students in each year of schooling from Prep to Year 10 to be exposed to food and fibre content as per the Australian and Victorian curriculum, this can be difficult if teachers do not have knowledge or access to appropriate resources to teach this in the classroom. Additionally, there is a shortage of agriculture and horticulture teachers in Victoria (in fact across Australia) and it is not unusual for schools not to have anyone who is trained to teach the subject.

To combat this lack of knowledge, the GIPPYAg project organised three 1-day professional development workshops which were free for primary and high school teachers in Gippsland. Events were held in Term 4 in Bairnsdale, Morwell and Leongatha. Each workshop consisted of three sections:

- Introduction to agriculture and horticulture at a national, state and regional level
- Hands-on lessons which can be replicated in the classroom
- Industry guest speaker and Q&A session

One of the key outcomes of the workshop was the opportunity for teachers to network with their peers from other schools, GIPPYAg project staff and industry professionals.

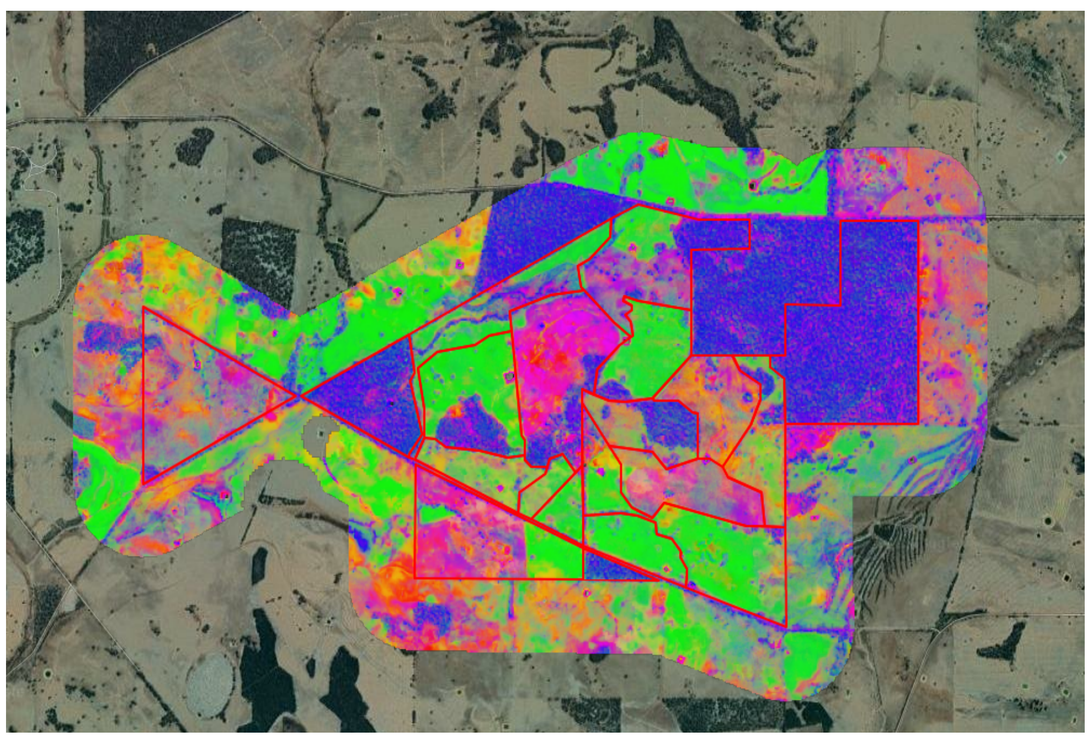
<u>Introduction to agriculture and horticulture</u>

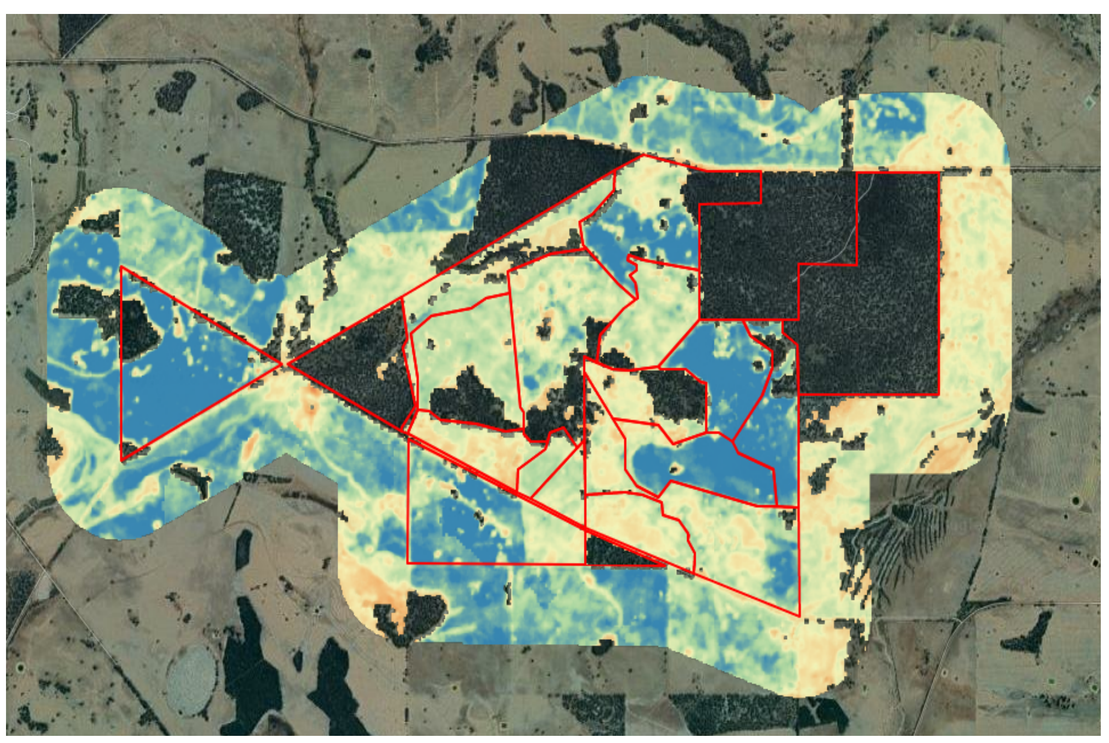
Each workshop opened with a presentation on the broader agricultural and horticultural industry at a national, state and regional level. It included key statistics that highlighted the economic contribution of the food and fibre sector as well as the job opportunities available. A careers in agriculture video produced by the Queensland Farmers Federation (with national application) was shown and feedback from teachers was that it was a good resource to highlight the wide variety of jobs that students may be interested in across the industry. This video showcased careers on the farm, in the field and in corporate offices – all contributing to food and fibre production.

A selection of Gippsland food and fibre businesses were showcased to demonstrate the diverse range of enterprises the region has on offer, followed by a summary of the study options students have to undertake post-school in agriculture both in Gippsland and across Victoria.

Digital Farm Mapping activity

Teachers were introduced to the importance of ground cover from the perspective of environmental sustainability and feed source for livestock on farms. Traditional methods of pasture estimation such as grass cuts and the use of rising plate meters were spoken about before new and emerging methods were introduced. These methods included satellite imagery and the benefits and limitations of this technology were outlined to teachers. This activity required teachers to work on their computers (or iPads) to observe satellite imagery for different farms using two free programs – Cibo Labs and DataFarming. Teachers worked through an activity booklet and learnt how they could expose students to up-to-date satellite imagery which they can then use to determine whether there is enough pasture available for farmers to feed their livestock. DataFarming allows students to digitally map their property, or a farm they are connected with, giving students the ability to more closely relate to the data. The skills associated with creating a digital map are transferable to a range of industries, not just agriculture, and this practical activity was seen by educators as an opportunity to improve the digital literacy skills of their students.





When discussing this activity as a group, teachers often reflected that a school oval would be a good area for students to study using satellite imagery and comparing this to what they observed themselves to see if these matched. Whilst it might be difficult for some primary school students to complete the entire practical, an app – GNSS viewer – which shows using augmented reality where satellites are currently in the sky was seen as a useful tool for young people of all ages. Additionally, some hard copy maps and simple questions might be useful as an introductory resource to primary school aged students.

Sweet Science Activity

The Sweet Science activity was introduced to teachers by discussing the different methods farmers use to determine when fruit is ready to be picked including manual use of human sense (e.g. sight, smell, feel) and more recent advancements including Brix meters and robots. This information is important as it showcases to teachers and in turn their students the level of technology that is utilised in the horticultural industry and how innovation is changing on-farm practice. It is often the perception that jobs on farm consist of manual labour and it is not widely know that a job in agriculture and horticulture can involve the use of cutting edge technology. It is hoped that teachers will take this information back to the classroom and perhaps this might inspire students to consider a career in the sector.

Next, teachers used refractometers (simple instruments approximately $120 each) to measure the Brix (sugar content) of a variety of fruits. Firstly, teachers used their senses to rank what they thought would be the sweetest fruit before squeezing some juice onto the refractometer to see if they were right. An advanced version of the activity included comparing the sweetness of 3 different types of apples and 3 of the same fruit (e.g. 3 grapes) to see if the Brix for each of the different fruits was the same. This stimulated discussion between the group as to why different fruits of the same species and even the same type might have different sugar levels. Teachers were then asked to graph their results, a skill which is important for students to master from an early age. All participants agreed that students would engage with this activity and it would be simple to replicate in the classroom (if their science lab had the right equipment). It could be utilised in a number of classes including science, food studies and maths.

Industry guest speakers

As shown in the sample schedule to the right, the sessions included a chance for the teachers to meet an agricultural industry member.

This meant that as well as an opportunity for teachers to network with each other and members of the GIPPYAg team, the day linked them to local producers. A questions and answer session with a different local producer each session gave the teachers some insight into the life of farmers in the region.

All of the guest speakers were members of Food and Fibre Gippsland.

TIME	SESSION
9:30 – 10:00AM	Welcome and Introduction
10:00 – 11AM	Data Farming and Cibo Labs
11:00 – 11:30	Morning Tea
11:30 – 12:30AM	Sweet Science
12:30 – 1:30PM	Lunch
1:30 – 2:30PM	Guest Speaker
2:30 – 3:00PM	Evaluation

The guest speakers included:

Matt Zagami: Matt Zagami is the founder of AvaGrow Farms - an Australian owned and operated family business located in the Wairewa Valley of East Gippsland which grows beans, cabbages and peas. The Zagami family has been involved in farming for over 30 years and Matt attended the University of Melbourne, Dookie Campus before coming home to run the farm. Matt together with his wife Katie and their four young children, Elijah, Charlotte, Zoe and Isaac currently have 180 Hectares under production.

Sallie Jones: Co owner of Gippsland Jersey, Sallie was born and raised on a dairy farm and spent her childhood in the farm's milking sheds with her father, and later in the family's ice cream shop. Despite personal tradgedy and ongoing issues in the dairy industry, Sallie and her business partner Steve bypass the large milk processors to ensure a fair price is paid to farmers, and gives consumers are clear choice when buying their milk. The business also returns a portion of profits to the Gippsland farming community to help support the mental and emotional wellbeing of dairy farmers who may be struggling.

Adam Schruers: Schreurs & Sons is a wholly-owned Australian family business started by grandparents Joe and Johanna and now being run by the third-generation of family members Christopher, Ben and Adam Schreurs who took over operations in 2013. Since then there has been a real focus on innovation and technology, introducing a new high-care packing facility and value-add prepack lines. What started as a humble celery operation in Clyde, Victoria, has now grown into a business spanning 7 properties and multiple product lines, including Crunchy Cuts Celery, prepack Leeks and mixed leaf salads.

STEM, FOOD & FIBRE

FREE PD!

FREE Teacher Professional Development

Open to primary and secondary teachers

The GIPPYAg project is an exciting new program linking Gippsland schools with our local food and fibre industries.

Delivered by Food & Fibre Gippsland and CQUniversity Australia, this professional development opportunity is for teachers across Gippsland to increase their capacity to incorporate food and fibre concepts into their teaching practice and classrooms.

- Hands on learning with technology in agriculture
- Easy and achievable lesson plans with resources ready to implement
- Aligned with AITSL Teaching Standards
- Meet industry professionals & create community networks
- Links to multiple subjects including science, biology, chemistry, agriculture, design, food technology, digital tech

FREE Full Day PD

TIME: 9.30am to 3:00pm

DATE: Tuesday November 26th 2019

LOCATION: The Hub,

27 Dalmahoy St, Bairnsdale 3875

RSVP by 12th November here:

https://bit.ly/2kHi9at

For more information:

Amy Cosby • 0405 824 112

EMAIL: a.cosby@cqu.edu.au

CQUniversity AUSTRALIA

VICTORIA State Government

Food & Fibre Gippsland

STEM, FOOD & FIBRE

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What is the PD About?

The following learning experiences have been designed to provide teachers a broad range of skills with specific classroom activities that can be incorporated or adapted in different courses.

SWEET SCIENCE

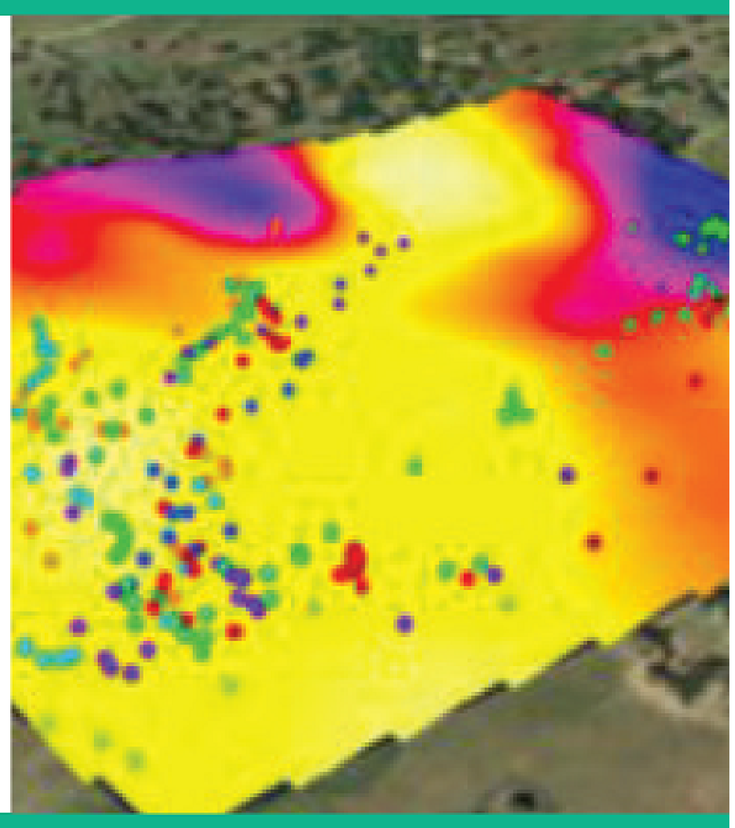
Farmers have traditionally only been able to test the ripeness of fruit using non-specific or invasive methods. In this workshop you will learn about the different methods farmers can use to measure the sugar content in different fruits using a refractometer (you can find these in your science lab at school). We will also explore new and emerging non-invasive technologies which can detect the ripeness of the fruit while it's still on the tree.

Key Learning Areas: Agriculture, Maths, Science, Design Technologies

DIGITAL FARM MAPPING & SATELLITE IMAGERY

Digital farm maps give farmers a basis to identify variability across a farm and the ability to apply inputs, such as fertiliser at varying rates for different areas of a paddock saving them money, time and the environment. You will have the opportunity to use the 'DataFarming' program to learn how to create a digital farm map, view current satellite imagery and identify opportunities and limitations of this data to make on-farm decisions.

Key Learning Areas: Visual Communication Design, Geography, Science, Agriculture, Design and Technologies, Digital Technology



INDUSTRY CAREER PANEL

You will have the chance to hear from a panel of local industry experts who will share their career pathway in the food and fibre industry. Learn about the opportunities available to your students and the STEM and technology skills the sector is looking for. You will have time to ask the panel questions to give you a a better understanding of the future employment prospects in Gippsland for the next generation.

RSVP by 12th November here:

https://bit.ly/2kHi9at

For more information:

Amy Cosby • 0405 824 112

EMAIL: a.cosby@cqu.edu.au

PARTICIPANTS

Both primary and secondary teachers who attended taught a range of subjects including science, IT, agriculture, food studies, english and careers. Teachers had a range of experience in the classroom with recently graduated teachers (1-year teaching) and highly experienced educators (30+ years) in attendance.

Date	Location/Venue	Participants
18/11/19	Traralgon Gippsland Tech School	12
22/11/19	Leongatha Sth Gippsland Bass Coast LLEN	6
26/11/19	Bairnsdale The Hub	10

RESULTS

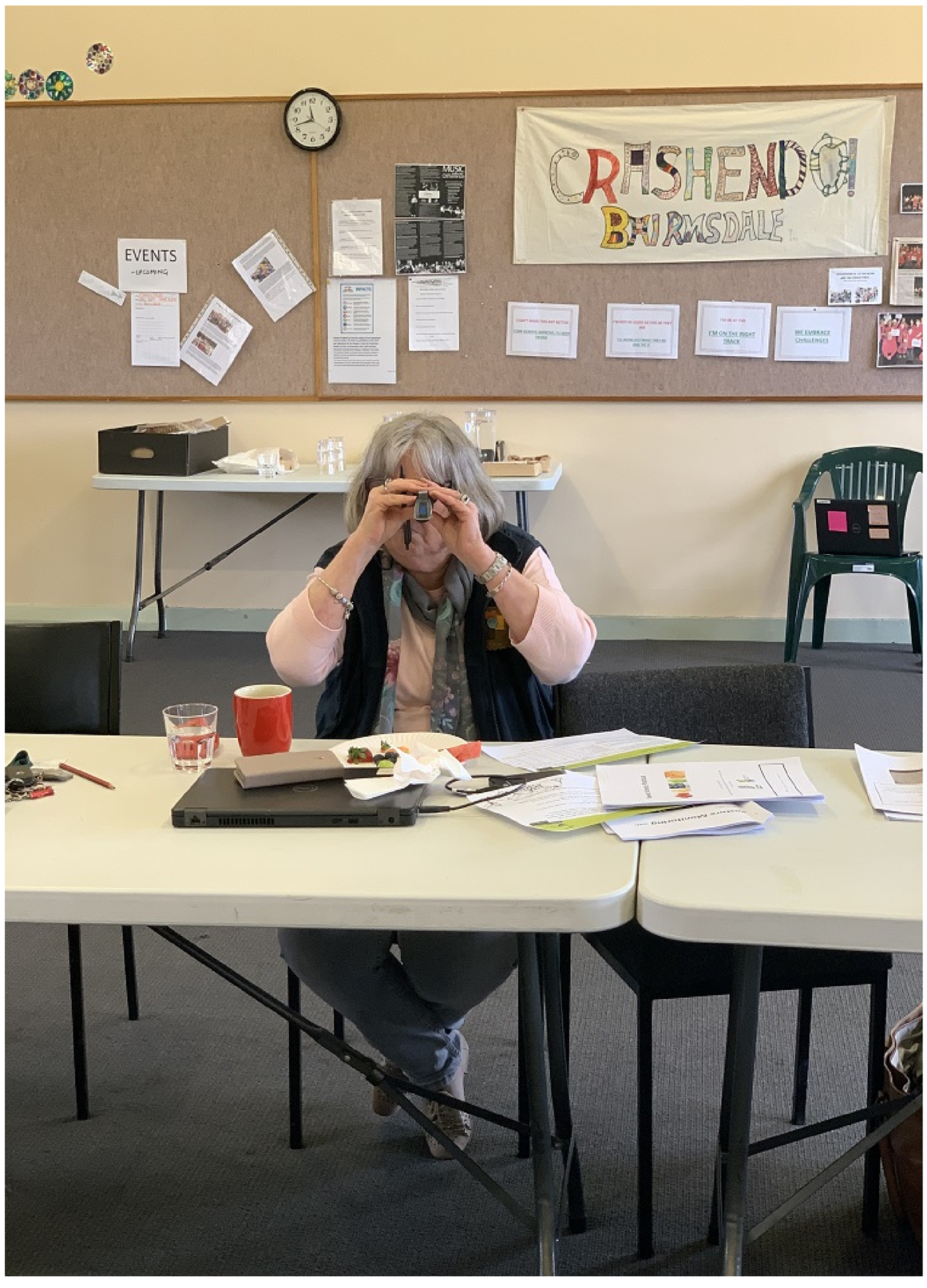
Participants were surveyed pre- and post- attendance at the PD event. The pre-survey asked a range of questions to determine the level of background knowledge and engagement teachers had with the agricultural industry prior to their attendance. It was also of interest to the GIPPYAg team to find out what the barriers were to teachers in Gippsland incorporating food and fibre concepts into their teaching programs and what resources were required. This information will be used to design future GIPPYAg programs to ensure that the project is meeting the needs of Gippsland teachers.

It was positive to see that over half of schools which had a teacher in attendance offered agriculture as a subject. Similarly, most of the teachers also already incorporated food and fibre concepts into their teaching programs. The workshop was designed that if a school does not offer agriculture the learning experiences could be incorporated into other subjects, e.g. science, food studies or geography.

Knowledge was the greatest barrier teachers faced when trying to incorporate more food and fibre content into the classroom and it was therefore unsurprising that more professional development opportunities and networks/support from other teachers were suggested by teachers as ways to overcome this lack of knowledge issue.

The majority of the teachers that completed the pre-survey had a positive perception of the agricultural industry which is a pleasing result. This did not necessarily equate to having a good knowledge of the agricultural industry or regularly visiting a farm over a 12-month period. Incorporating a farm visit as part of the workshop (if time permits) might be a useful addition to future programs.

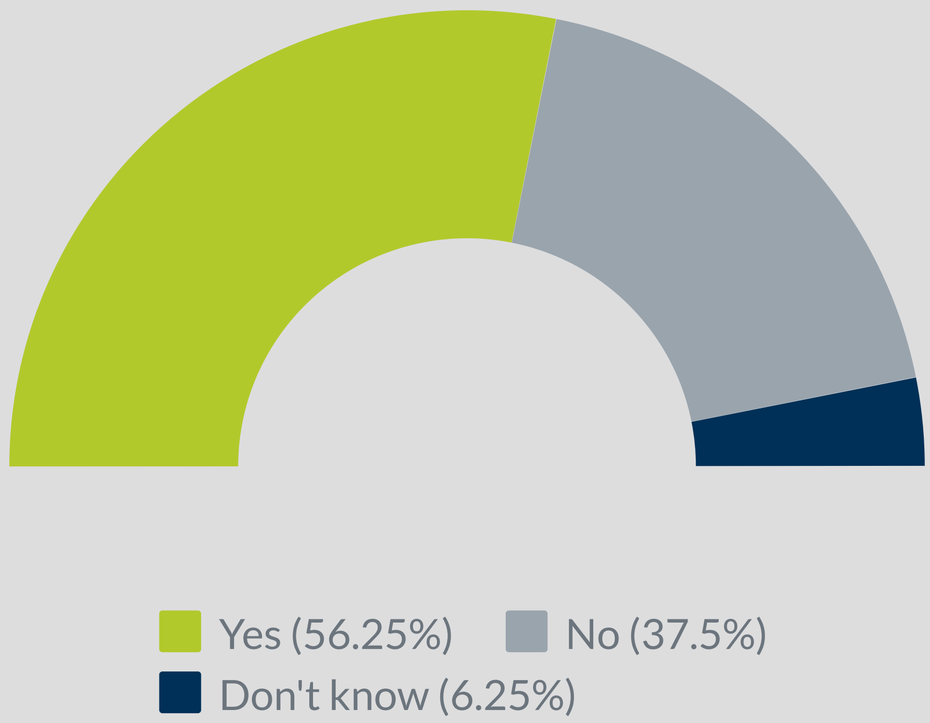
The use of STEM skills in careers in the agricultural and horticultural industry was recognised by the majority of respondents which is positive, similarly that food and food-related concepts could be used to teach STEM skills in the classroom. Research has demonstrated that the connection between STEM and food and fibre is not always recognised and it is therefore pleasing to see that respondents to this survey were aware of the relationship.



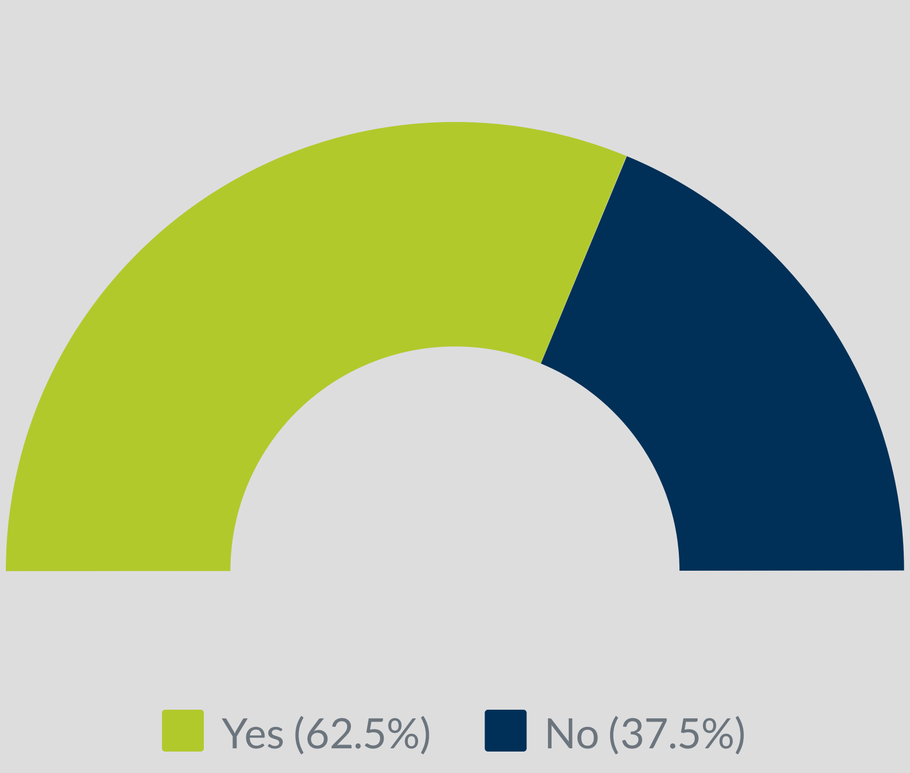
It was pleasing to see that all aspects of the STEM, Food and Fibre Workshop received a rating of over 4 out of 5 in the post event survey. The lowest score (4/5) was received for the Digital Farm Mapping activity. This is unsurprising as it was the most difficult activity and would require teachers to practice using the technology before implementing in the classroom. It was also encouraging to have all teachers state they would recommend their colleagues attend a future event which demonstrates that those who participated found the workshop worthwhile.

PRE-EVENT SURVEY

Does your school offer agriculture as a subject?



Do you incorporate food and fibre concepts into your current teaching program?



What support/resources do you need?

Personal relationships with farmers

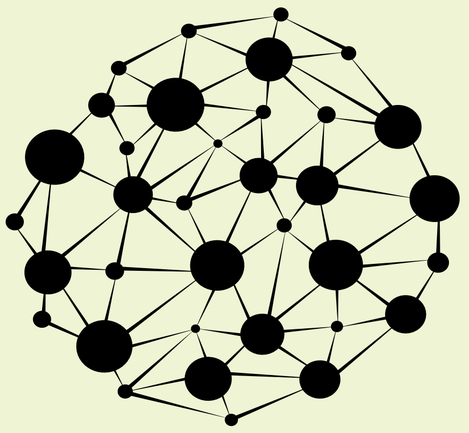
17%

More professional development opportunities

29%

Networks and support from other teachers

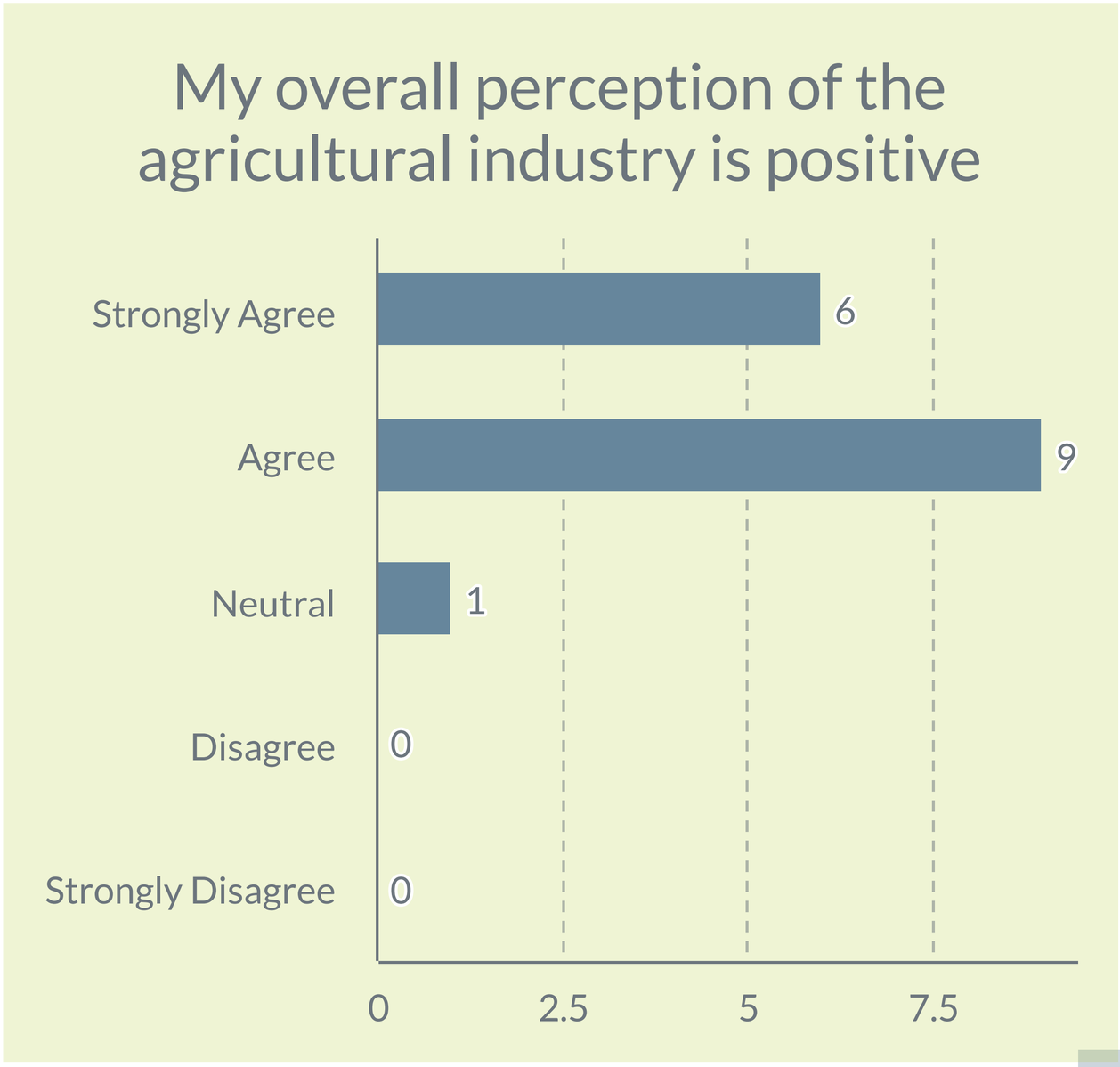
29%



Online resources

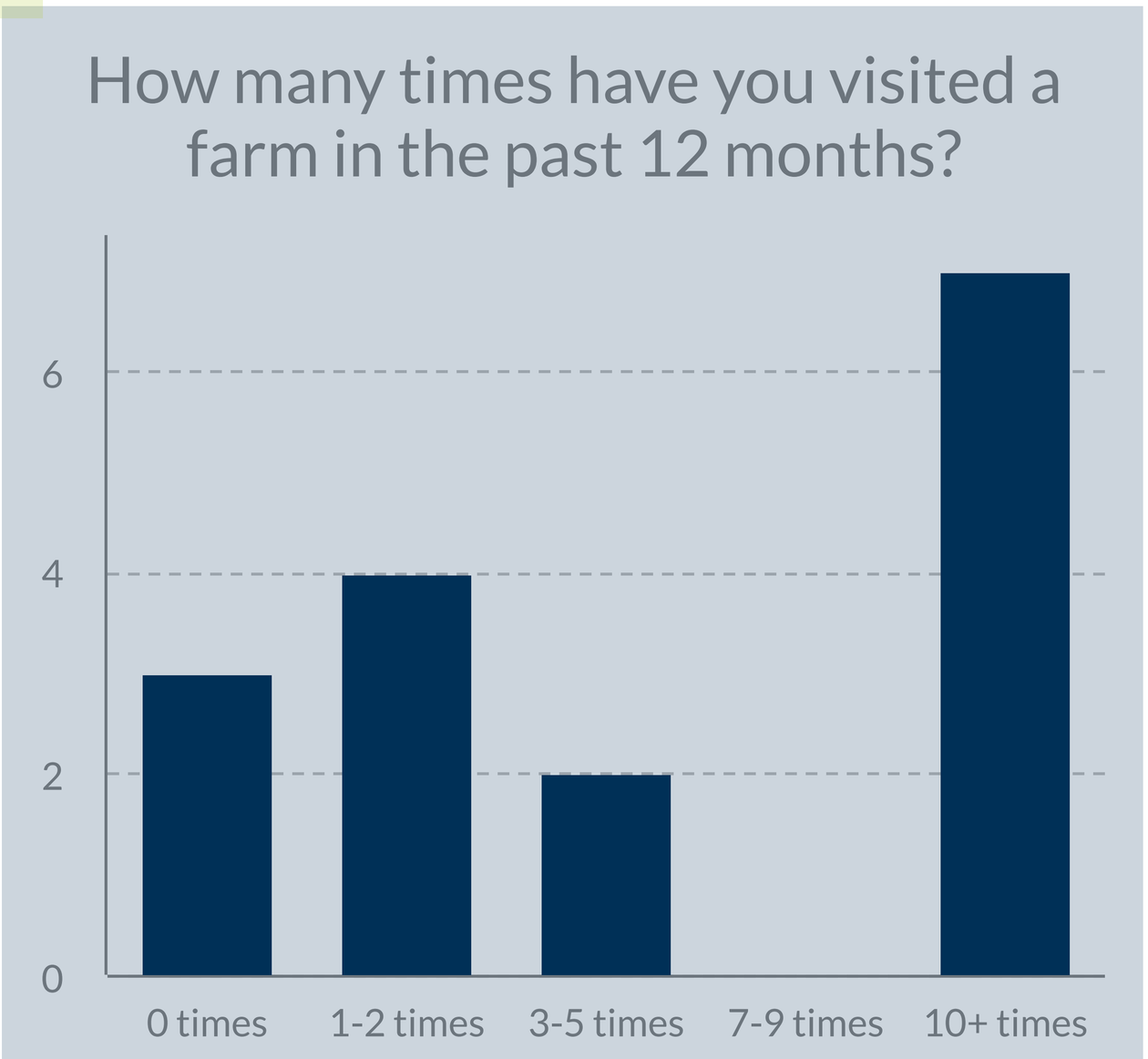
23%

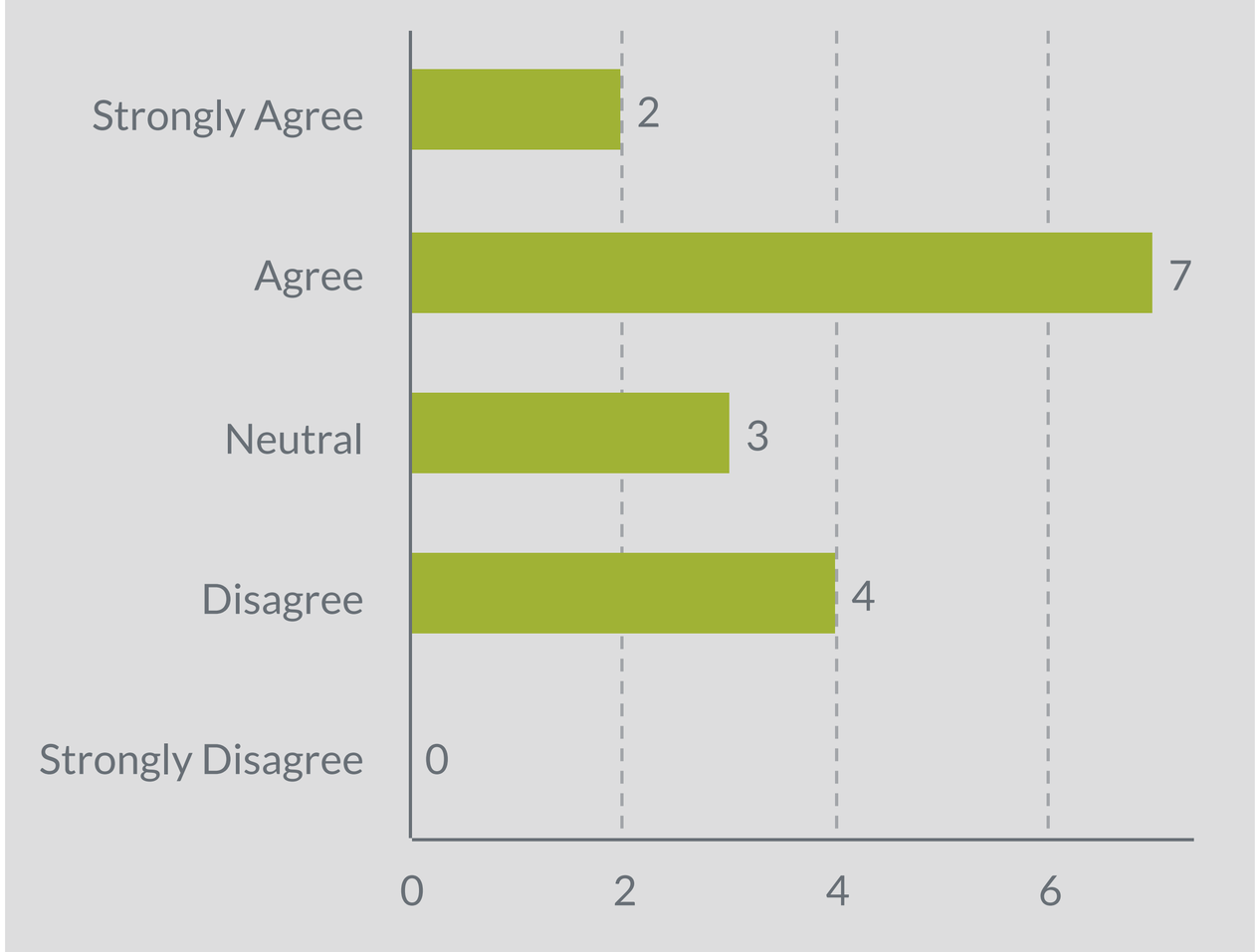
What barriers do you face in increasing the level of food and fibre concepts in your teaching program? (Select all that apply)



'Thanks Amy for a very interesting and engaging day. Keep up the great work!'

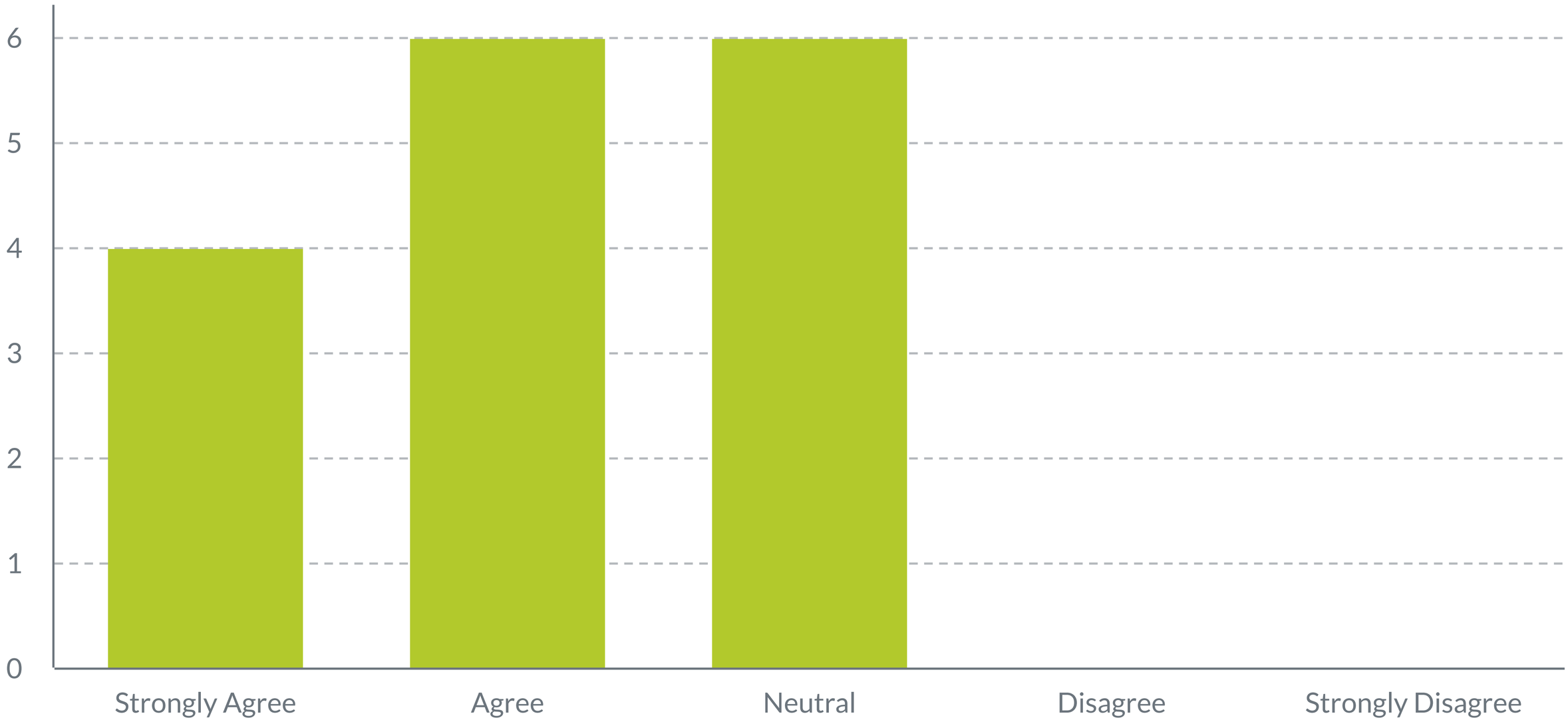
'Very informative. Activities links well to current Vic Curriculum Technology Food and Fibre in addition to Science.'





'I've actually just emailed one of my colleagues and told him he should try to come to the next PD. I think he would get so much out of it!'

Food and fibre concepts are easily transferable into my STEM and digital technology teaching

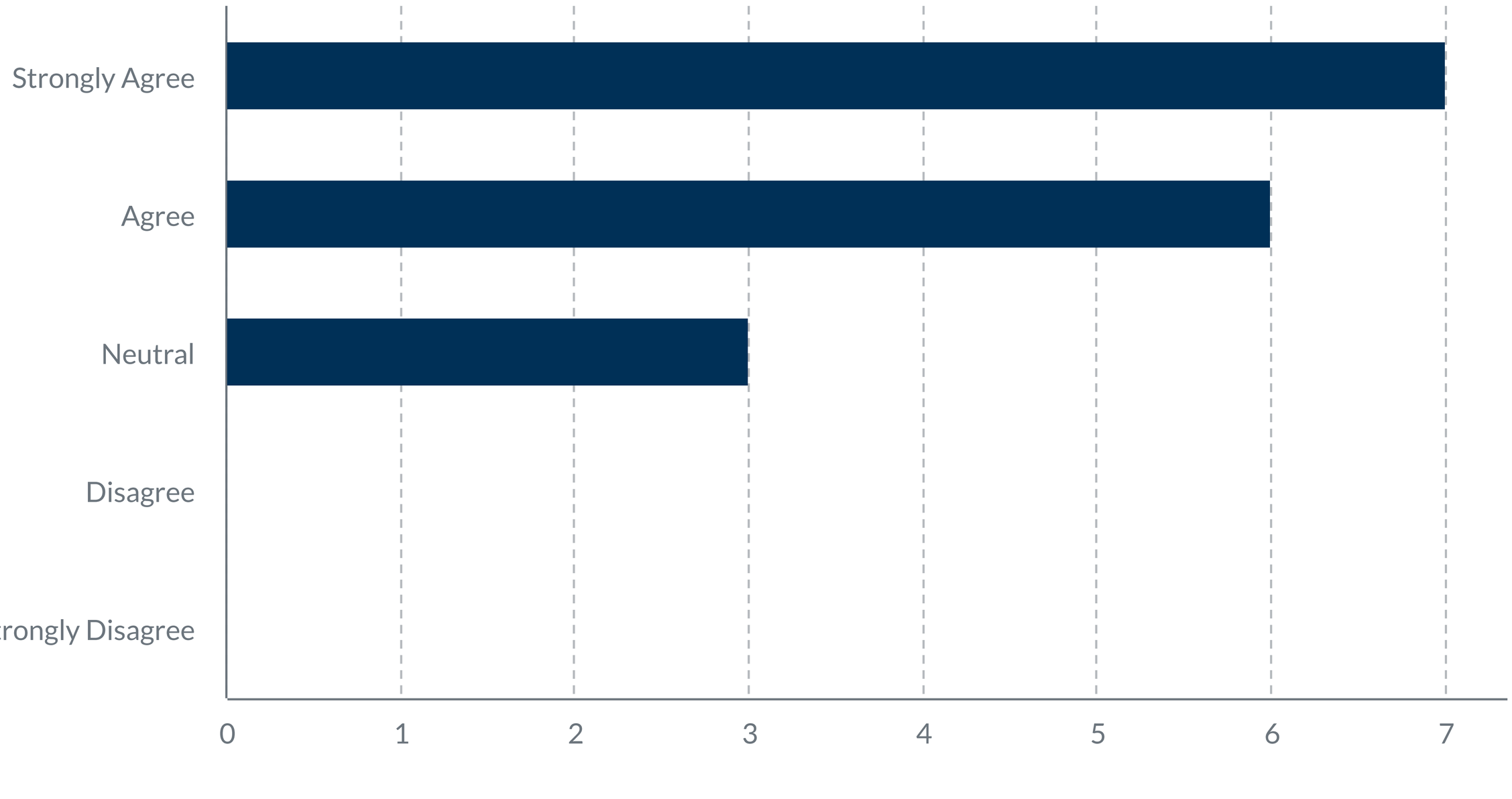


'The guest speaker, Sally was amazing and inspiring. The Sweet science activity was fun and good that it was hands on.'

'Very well run and informative event.'

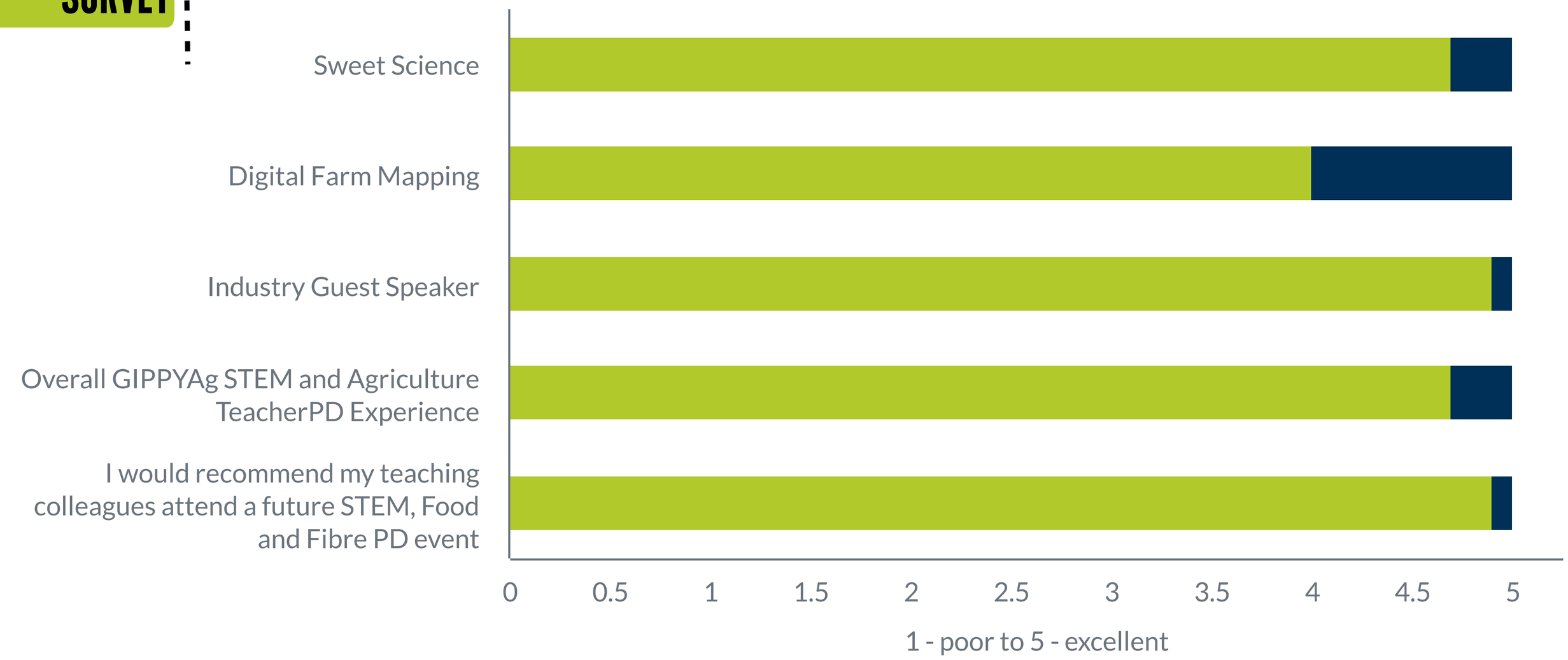
'Informative sessions with ready to use tools and resources. Great networking opportunity too.'

I believe STEM skills are utilised in all agricultural careers



POST-EVENT SURVEY

Ranking of GIPPYAg STEM and Agriculture TeacherPD



CONCLUSION

The GIPPYAg STEM, Food and Fibre Teacher Professional Development Workshops were well received by all that attended. Future workshops will follow a similar program and include an industry guest speaker and lessons which can be taken back and utilised in the classroom.

Feedback received indicate that these workshops would be better attended if they were held earlier in the year before teacher relief money had been fully allocated in schools. Additionally, a separate workshop targeted at school leaders (e.g. Principals, Deputy Principals) and career advisers would be useful as these positions are key influencers of both school policy and student aspirations.