

Assessment Schedule – 2024**Scholarship: Agricultural and Horticultural Science (93105)****Evidence****QUESTION ONE: Agricultural and horticultural production in a regulatory environment**

Score	Performance descriptor from Scholarship standard	Evidence statement	Mark
Outstanding level of performance	<i>In addition to the requirements for Scholarship level, the candidate will also demonstrate, in a sustained manner, aspects of:</i> • <i>perception and insight</i> • <i>sophisticated integration and abstraction</i> • <i>independent reflection and extrapolation</i> • <i>convincing communication.</i>	The candidate: • discusses a range of relevant compliances • gives a perceptive / insightful discussion on the positive and negative effects compliance has on being able to grow and market the produce • provides perceptive / insightful discussion on different perspectives to compliance requirements • provides a well-structured, clearly discussed answer.	7 or 8
Scholarship level of performance	<i>The candidate will demonstrate aspects of high-level:</i> • <i>analysis and critical thinking</i> • <i>integration, synthesis, and application of highly developed knowledge, skills, and understanding to complex situations</i> • <i>logical development, precision, and clarity of ideas.</i>	The candidate: • identifies a range of relevant compliances • discusses in detail the positive and negative effects compliance has on being able to grow, and market the produce • discusses various perspectives on compliance requirements • produces a well-structured answer.	5 or 6
Below Scholarship level of performance		The candidate: • identifies a range of compliances • provides some positive and negative effects compliance has on being able to grow and market the produce • provides a perspective on compliance requirements • produces an answer that lacks structure.	1–4

Sample evidence

Dairy

Topics that may be covered:

On farm

- effluent, storage, and application
- water metering
- animal welfare
- monitoring and recording, including the National Animal Identification and Tracing (NAIT) programme
- risk assessment programme
- stock exclusions
- national freshwater regulations
- farm health and safety

Processor, e.g. Fonterra

- quality systems
- risk management
- on-farm requirements
- storage and transport
- milk quality framework
- regulatory compliance, both for country of manufacture and country of sale

Industry

- DIRA
- greenhouse gas emissions (GHG)
- export – New Zealand legislation and operating requirements, overseas market access, e-cert.

QUESTION TWO: Weather events and climate change

Score	Performance descriptor from Scholarship standard	Evidence statement	Mark
Outstanding level of performance	<i>In addition to the requirements for Scholarship level, the candidate will also demonstrate, in a sustained manner, aspects of:</i> • <i>perception and insight</i> • <i>sophisticated integration and abstraction</i> • <i>independent reflection and extrapolation</i> • <i>convincing communication.</i>	The candidate: • discusses the climatic requirements for production • gives a perceptive / insightful discussion on the potential for the primary production system to be negatively impacted by weather events • provides perceptive / insightful discussion on options to mitigate the negative impacts of climate change to allow for sustainable production • provides a well-structured, clearly discussed answer.	7 or 8
Scholarship level of performance	<i>The candidate will demonstrate aspects of high-level:</i> • <i>analysis and critical thinking</i> • <i>integration, synthesis, and application of highly developed knowledge, skills, and understanding to complex situations</i> • <i>logical development, precision, and clarity of ideas.</i>	The candidate: • discusses the climatic requirements for production • discusses in detail the potential for the primary production system to be negatively impacted by weather events • discusses options to mitigate the negative impacts of climate change to allow for sustainable production • provides a well-structured answer.	5 or 6
Below Scholarship level of performance		The candidate: • identifies the climatic requirements for production • partially discusses the potential for the primary production system to be negatively impacted by weather events • partially discusses options to mitigate the negative impacts of climate change to allow for sustainable production • produces an answer that lacks structure.	1–4

Sample evidence

Kiwifruit:

Recent impacts (2023 adverse weather focus – Auckland flooding (January), Cyclone Gabrielle (February), and hail in Bay of Plenty (April))

- Forecasted 2023 exports will be down by 18% – or roughly 30 million trays – on last year, due to challenging weather conditions.
- There were issues with fruit quality and denting returns to growers.
- The 2023 season saw a limited supply of kiwifruit, particularly green kiwifruit. The volume of fruit was the lowest in the past 20 years, with around 42 million green trays (61 million trays in 2022).
- With the lower volumes, focus shifted to the opportunity to lift fruit quality with the remaining harvest. Across the supply chain, this was supported by initiatives that were established as part of the industry's Quality Action Plan.
- As a result, a limited supply of kiwifruit was available for customers this season. However, feedback has been positive with strong demand from consumers.
- Supply for 2024 is expected to be significantly boosted with a greater volume of quality fruit, as growers rebound from the 2023 weather-related reduced yields. In addition, more licenced SunGold kiwifruit hectares will be coming into maturity.
- It has been a challenging year for other countries' growing seasons as well.

The future:

- There will likely be extreme weather events in many regions of New Zealand. The changeable climate of the Bay of Plenty is a result of natural variability. However, it is predicted that there will be sufficient rainfall in the Bay of Plenty, but the projected rainfall changes are unlikely to be detrimental. However, security of water supply for irrigation is the concern, with some growers already developing dams to capture and store runoff.
- Over time, there will be changes in variety (more gold, less green, new varieties), location (sites with cooler winters), and land use (different crops, subdivision).
- Post-harvest operations are already adapting to warmer autumns, with a focus on issues related to the removal of field heat, fruit curing before to storage, and improved insulation and increased energy efficiency of cool stores.
- For the kiwifruit sector, the largest risk is loss of winter chilling. NIWA data shows winter in 2022 was the warmest on record, exceeding temperature records set in 2021 and 2020. This trend is forecast to continue, with all regions across New Zealand experiencing the seasonal warming trend. In warmer winters, kiwifruit tend to break bud less frequently and later in the season. Both green and gold varieties are affected by a reduction in winter chilling. However, green varieties tend to see a greater decrease in fruit yields and quality. Currently, green kiwifruit makes up approximately 44% of New Zealand-grown kiwifruit, so warming winter temperatures are likely to impact the kiwifruit industry. Bud-break enhancers containing hydrogen cyanamide may be phased out of New Zealand markets by the Environmental Protection Authority. This makes the need to assess different adaptation options even more critical for kiwifruit growers to transition successfully into the future.
- The kiwifruit industry will face changes in coming decades as the effects of warming temperatures begin to limit the viability of green kiwifruit in traditional growing areas. As a result, growers may need to consider adaptation options. Eventually this may need to include either different kiwifruit varieties or different land uses. However, global warming also provides opportunities for the horticultural sector. A hotter climate may see other regions like Hawke's Bay, Whanganui, Wairarapa, Canterbury, and Central Otago starting to grow the fruit.

QUESTION THREE: Exporting New Zealand's agricultural and horticultural production

Score	Performance descriptor from Scholarship standard	Evidence statement	Mark
Outstanding level of performance	<i>In addition to the requirements for Scholarship level, the candidate will also demonstrate, in a sustained manner, aspects of:</i> • <i>perception and insight</i> • <i>sophisticated integration and abstraction</i> • <i>independent reflection and extrapolation</i> • <i>convincing communication.</i>	The candidate: • gives a perceptive / insightful discussion on the reliance on export markets • provides perceptive / insightful discussion on the benefits / advantages and risks / threats that export markets pose • provides perceptive / insightful discussion on actions that can be taken to allow for greater resilience to those risks / threats • provides a well-structured, clearly discussed answer.	7 or 8
Scholarship level of performance	<i>The candidate will demonstrate aspects of high-level:</i> • <i>analysis and critical thinking</i> • <i>integration, synthesis, and application of highly developed knowledge, skills, and understanding to complex situations</i> • <i>logical development, precision, and clarity of ideas.</i>	The candidate: • discusses the reliance on export markets • discusses in detail the benefits / advantages and risks / threats that export markets pose • discusses actions that can be taken to allow for greater resilience to those risks / threats • provides a well-structured answer.	5 or 6
Below Scholarship level of performance		The candidate: • identifies the reliance on export markets • partially discusses the benefits / advantages and risks / threats that export markets pose • partially discusses actions that can be taken to allow for greater resilience to those risks / threats • produces an answer that lacks structure.	1–4

Sample evidence

Exporting:

- Trade is critical to New Zealand's economy. We can only pay for the goods and services we import from overseas by selling exports to other countries. At the moment, international trade (exports and imports) make up around 60% of New Zealand's total economic activity.
- Supporting open markets is a logical response to the nature of our economy. With a population of only 5.3 million people, New Zealand lacks the scale to produce diverse high-quality goods we import at affordable prices, and we are too small to provide a market that would sustain many of our export sectors.
- The jobs of more than 600,000 New Zealanders are in direct export sectors or in sectors supporting exports. Many of these jobs are in the regions. Overseas markets provide the opportunity for New Zealand businesses to grow to a scale that simply could not happen in New Zealand alone.
- New Zealand is the world's 12th largest agricultural exporter by value. New Zealand is the number one sheep meat exporter, the number one dairy product exporter, and the second biggest wool exporter.
- Improving productivity, value-add, and export earnings in this sector are critical to New Zealand's sustainable economic growth. Free Trade Agreements (FTAs) are one way the government can support such growth.
- The top exports of New Zealand are milk powder (\$11.1B), sheep and goat meat (\$4.35B), raw wood (\$4.31B), frozen beef (\$3.77B), and butter (\$3.28B) – exporting mostly to China (\$22.5B), Australia (\$8.03B), United States (\$7.18B), Japan (\$3.76B), and South Korea (\$2.06B).
- The pandemic exposed vulnerability of the global supply chains.
- New Zealand not only needs to look at diversifying the countries it sells to, but also the products it sells.

China focus

- As New Zealand's exports to China have grown over the past two decades, what we farm and what we export has changed to suit our biggest dairy partner, i.e. milk powder, logs, meat carcasses.
- New Zealand cuts approximately 40 million cubic metres of wood with 50% going to China. However, there are other markets, e.g. EU (in particular Germany), Japan, and USA for wood products like wood pulp, paperboard, etc.
- India has been standing out as having good opportunities for New Zealand's radiata pine exporters – at prices close to Chinese values. However, it hasn't been a great market in recent years with Uruguay shipping a cheaper product.
- Dairy products, such as yoghurt, cheese, and butter could find huge growth potential in EU markets, if restrictions were lifted or eased.
- A relationship with China is critical for New Zealand, and lessons can be learned from Australia. Australia has had restrictions placed on forestry products, wine, and barley by way of tariffs and bans, as China demonstrates its displeasure with Australia backing the international investigation into the origins of the COVID-19 pandemic.

Cut Scores

Scholarship	Outstanding Scholarship
13–21	22–24