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NZQA
NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

QUALIFY FOR THE FUTURE WORLD
KIA NOHO TAKATŪ KI TŌ ĀMUA AO!

Scholarship 2021
Agricultural and Horticultural Science

Time allowed: Three hours
Total score: 24

QUESTION BOOKLET

There are three questions in this booklet. Answer ALL questions.

Write your answers in Answer Booklet 93105A.

Check that this booklet has pages 2–4 in the correct order and that none of these pages is blank.

YOU MAY KEEP THIS BOOKLET AT THE END OF THE EXAMINATION.

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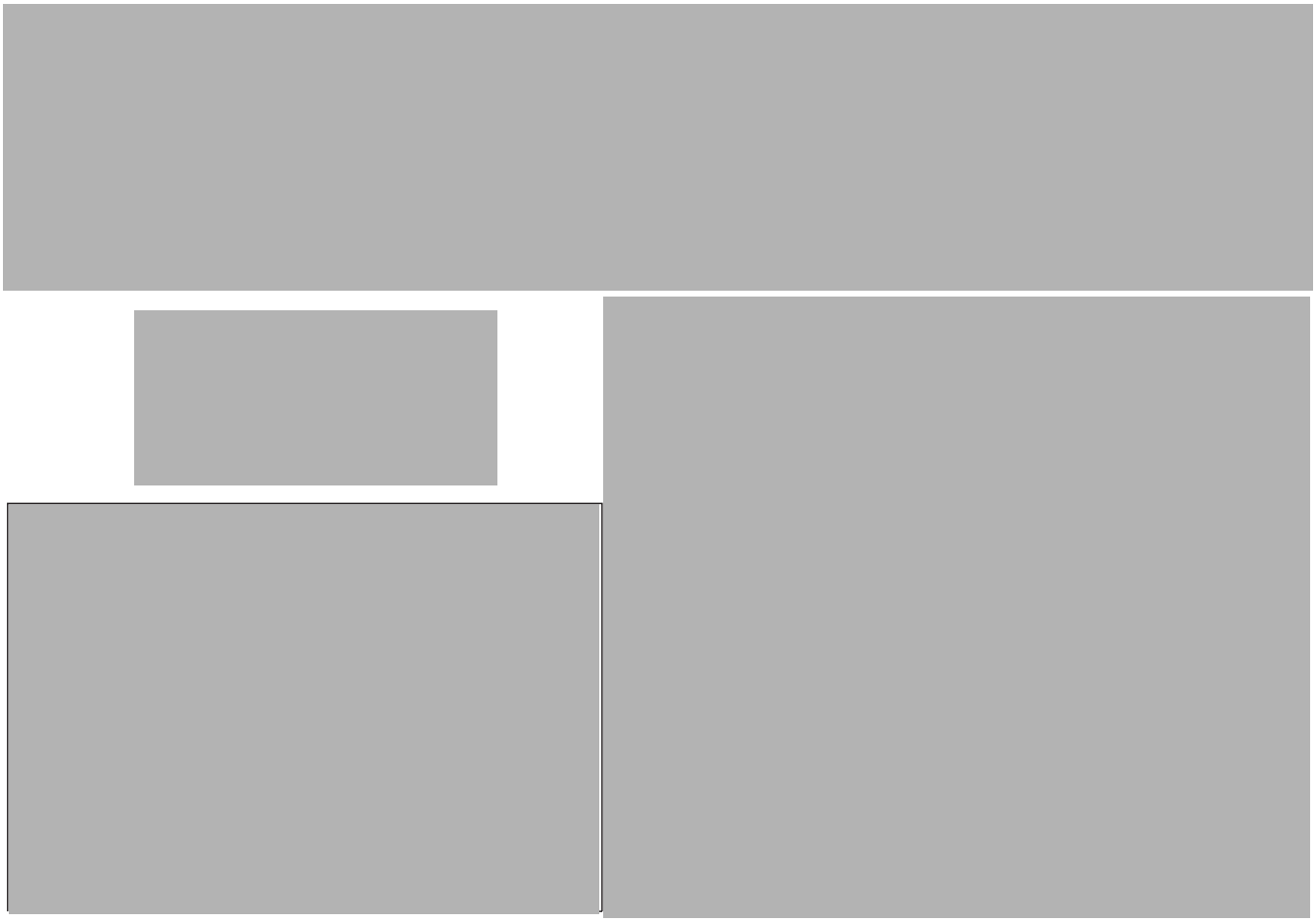
INSTRUCTIONS

Answer ALL questions in this booklet.

Start planning your answers to Questions One, Two and Three on pages 2, 8 and 14 of your answer booklet.

QUESTION ONE: New technologies in primary production systems

The continued development and implementation of new technologies has been a feature in all primary production systems. These changes have occurred at all stages, from production through to processing, distribution, and marketing of the product to consumers.



First row (left to right): Drones in agriculture, robotic milking, robotic fruit picking.
Second row (left to right): Electronic ear tagging, produce barcoding, automated fruit grading.
Last row (left to right): Geographic Information System (GIS) technology system chart, GPS satellite technology in tractors.

With reference to a primary production system, discuss how new technologies have been, or are being, adopted. Analyse the advantages and / or disadvantages these technologies pose.

QUESTION TWO: The resilience of primary production systems to disruptive events

Primary production systems are at risk of events that can disrupt them. These events could be climatic, political, economic, biological, or social.

Discuss the resilience of a New Zealand primary production system to cope with events that may disrupt either the production of the product or the ability to market it to the consumer.

QUESTION THREE: Freshwater management in New Zealand

With reference to TWO primary production systems in New Zealand, analyse the tension between freshwater management and balancing economic gains, social well-being, and environmental implications.

Acknowledgements
Material from the following sources has been adapted for use in this examination:

Question One
Drones in agriculture (photo) https://www.geospatialworld.net/blogs/drones-revolutionizing-agriculture/, (2017)
Milking robot (photo) https://farmersweekly.co.nz/ (2019)
Apple-picking robot (photo) https://www.nzherald.co.nz/ (2019)
NAIT tags (photo) https://nz.ztags.com/products
Zespri produce barcoding (photo) https://www.producereport.com (2016)
Apple grading (photo) https://www.tomra.com/en/sorting/food
GIS chart (image) https://www.esri.com/news/arcnews/fall07articles/gis-the-geographic-approach.html
John Deere operations centre (photo) https://www.deere.com/en/technology-products

Question Three
Irrigation system (photo) https://www.klclutch.com/services/industries-we-serve/pumping-and-irrigation/
Fly fishing (photo) https://www.guidedflyfishtaranaki.com/
Horse drinking (photo) https://www.horsetalk.co.nz/2018/10/05/five-things-horses-need/