



Core units: Exemplars – Year 9

Illustration 2: Agricultural innovation in Australia

Some historical innovations in agriculture

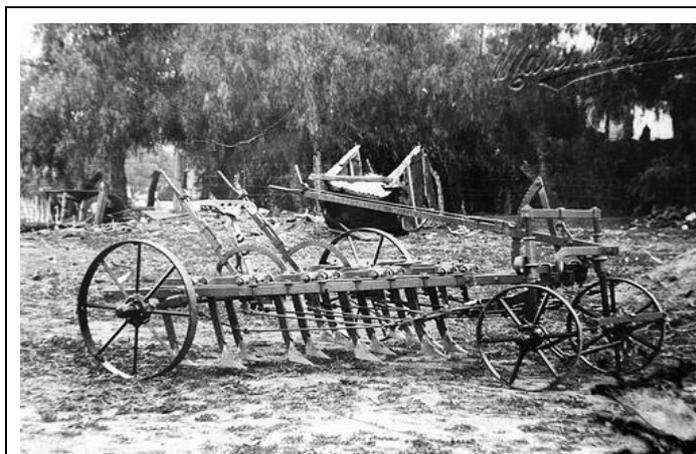
A number of photographs of Australian agricultural machinery from the past and present day are provided here. In any society dependent on farming, farmers must be skilled at increasing production to provide food for the growing population and to be commercially viable. The photographs show you the changes that have taken place over time in this attempt to keep farming productive and sustainable.

Look at the photographs of farming equipment, and think about how farmers have coped with the environmental conditions in Australia, and how they have developed and refined production techniques to ensure food security over time.

Some inquiry questions are provided for you to consider and answer.

	<p style="text-align: right;">1</p> <p>Mallee roller</p> <p>Mallee trees were knocked down by scrub rollers invented by Charles Mullens at Wasleys, South Australia. The rollers were then improved by William Fowler, and this allowed a team to travel over already rolled scrub. The scrub was then burnt leaving the stumps.</p>
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Source: © Mark D Manuel

	<p style="text-align: right;">2</p> <p>The stump-jump plough</p> <p>In 1876 the stump-jump plough was invented in Ardrossan, South Australia, by RB and Clarence Smith. When one of the mouldboards on this plough hit a stump or root, its levers allowed it to rise out of the ground and pass over the obstruction, thus enabling partially cleared land to be cultivated successfully.</p>
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Source: State Library of South Australia,

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3

Another version of the stump-jump plough



4

Mallee farming in South Australia

Once the land was cleared of all stumps the sandy soil became vulnerable to wind and water erosion, especially when paddocks were ploughed up and down the slopes. Contour banks were developed by farmers to assist in the stabilisation of their valuable farmland.



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Mallee farming in South Australia

Farmers soon learnt that ploughing across the slope was a far more sustainable practice.

Source: All images © Mark D Manuel



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Pioneer farming in South Australia

Pioneer farmers historically made many mistakes. Many had little knowledge, especially in relation to the climate over time. Many farms were abandoned after successful seasons were followed by years of drought. Surveyor General Goyder in South Australia declared his Goyder's Line in 1865. The areas to the north of the Line were deemed to receive insufficient rain for farming (about 300 mm).

Source: © Mark D Manuel

Inquiry questions

Consider photographs 1–5.

Find out more about the characteristics of mallee trees and answer the following questions:

- Why were they difficult to clear?
- What did farmers do before these inventions?
- What were they attempting to do in the farming process with these new inventions?
- How were the items in photographs 1–3 used and handled?
- How did they improve the methods of farming?
- Would they have improved farm yields?
- What would have made life even easier?

Imagine you were an early settler in the 1860s in South Australia:

- Where would you gain your knowledge about the climate so you could start your farming venture?
- Where would you look to set up your property?
- What obstacles would you face?
- What farming knowledge would you need?
- How different might it have been from your homeland in England?
- Who could assist you in those times?

Other inventions



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Combine harvester 1870s

- What did farmers do before this was invented?
- How might this invention make life easier for the pioneer farmers?
- How did it work? What did it do?
- What was needed to work it?
- How difficult was it to use?
- What problems might a farmer have with this machine?



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Union harvester 1890s

- What was needed to work this machine?
- Is it any different from the one above?



9

Bullock dray

- How was the dray used?
- What was needed to make it work?
- Why was it used?
- What did it carry?
- What inventions after this helped farmers?



10

Woolshed 1880s: Angorichina Station, Flinders Ranges, South Australia

The woolshed is made from native pine trees.

- What were shearing sheds used for?
- Why were they important?
- How innovative were the local farmers?

Source: All images © Mark D Manuel

Farm machinery: Early 1900s

11



12



13



14



15



16

Source: All images © Mark D Manuel

Inquiry questions

Consider photographs 11–16 and answer the following questions:

- What might these pieces of machinery be used for?
- What was used as a power source for each?
- What sequence might they have been used in to prepare paddocks?
- How much labour might have been involved in the process?
- What type of farming were they used for?
- How might the tractor have revolutionised farming?
- How important was the car to the farming community?



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Car graveyard in a farming community

Recent innovations in agriculture



18

Animal research and breeding



19

Polyhouse or glasshouse technology

Provides year-round production of fruit and vegetables.

Source: All images © Mark D Manuel



Modern dairy

20



Modern cereal harvester without boom

21



Modern boom for harvester

22

Source: All images © Mark D Manuel



23

Modern harvesting machinery



24

Modern crop-spraying machinery



25

Modern crop-spraying tractor

Source: All images © Mark D Manuel



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Modern hay-baling machine



27

Modern minimum-till plough and seeder

Source: All images © Mark D Manuel

Inquiry questions

Consider photographs 18–27 and answer the following questions:

- Who uses this equipment or technology?
- What type of farming uses this equipment?
- Where might it be used best?
- Which farming zone does it belong to?
- What is it used for?
- What type of land is needed to operate this equipment?
- How might this machinery technology improve the efficiency of farming?
- Can you describe the seasonal sequence of farming on these types of farms?
- What equipment is used to manage that sequence?
- How might this machinery make farming more sustainable?
- How labour-intenesive are the machinery innovations above?
- How might GPS technology be used with some of this equipment?
- What might some of the issues be with machinery of this size in photographs 21–27?
- How much do they cost?