

Write your name here

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Other names

**Pearson**  
**Edexcel GCSE**

Centre Number

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Candidate Number

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# Geography B

## Unit 3: Making Geographical Decisions

**Higher Tier**

Tuesday 9 June 2015 – Morning

**Time: 1 hour 30 minutes**

Paper Reference

**5GB3H/01**

**You must have:**

Resource Booklet (enclosed)

Total Marks

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### Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided  
– *there may be more space than you need.*

### Information

- The total mark for this paper is 53.
- The marks for **each** question are shown in brackets  
– *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (\*) are ones where the quality of your written communication will be assessed  
– *you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.*
- The marks available for spelling, punctuation and grammar are clearly indicated.

### Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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**Answer ALL questions.**

**1** Study Section 1 (pages 2, 3 and 4) of the Resource Booklet and answer the following questions.

(a) (i) Define the term **aquifer**.

(2)

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(ii) Outline how the Ogallala aquifer was formed.

(2)

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(b) Study Figure 1a.

Describe the distribution of settlements in the Ogallala aquifer region.

(3)

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(c) Study Figures 1a and 1b.

Examine the relationship between height and precipitation in the Ogallala aquifer region.

(4)

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(d) Study Figures 1b and 1c.

Suggest why some states in the region are more dependent on the Ogallala aquifer than others.

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(e) Explain how future climate change might affect the Ogallala aquifer.

(4)

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**(Total for Question 1 = 19 marks)**

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**2** Study Section 2 (pages 5, 6, 7 and 8) in the Resource Booklet and answer the following questions.

(a) Study Figures 2a and 2b.

Outline **one** impact of centre-pivot irrigation on the environment of Nebraska.

(2)

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(b) Study Figure 2c.

Describe the changes in the use of corn between 2001 and 2011.

(4)

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**Spelling, punctuation and grammar will be assessed in your answer to this question.**

**\*4** Study the three options for the United States government shown below.

**Option 1: Encourage further development of intensive agriculture in the Ogallala aquifer region.**

**Option 2: Prevent any further development of intensive agriculture in the Ogallala aquifer region.**

**Option 3: Replace intensive methods of agriculture with more traditional approaches such as cattle ranching in the Ogallala aquifer region.**

Select **one** option you think would be the best for both the **people** of the USA and the **environment** of the **Ogallala region**.

Justify your choice.

Use information from the Resource Booklet and your knowledge from Units 1 and 2 to support your answer.

(9)

Chosen option .....

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Handwriting practice area with 25 horizontal dotted lines.





**Pearson Edexcel GCSE**

# **Geography B**

## **Unit 3: Making Geographical Decisions**

Tuesday 9 June 2015 – Morning

**Resource Booklet**

Paper Reference

**5GB3F/01**

**5GB3H/01**

**Do not return the Resource Booklet with the question paper.**

### **Instructions**

- Read the information on the problem on page 2 first.
- You are advised not to write for the first 30 minutes, read and make pencil notes only during this time.
- When reading, make links with other topics you have studied in Unit 1 (eg Water World and Changing Climate) and Unit 2 (eg Population Dynamics and Development Dilemmas).

*Turn over* ►

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## The problem

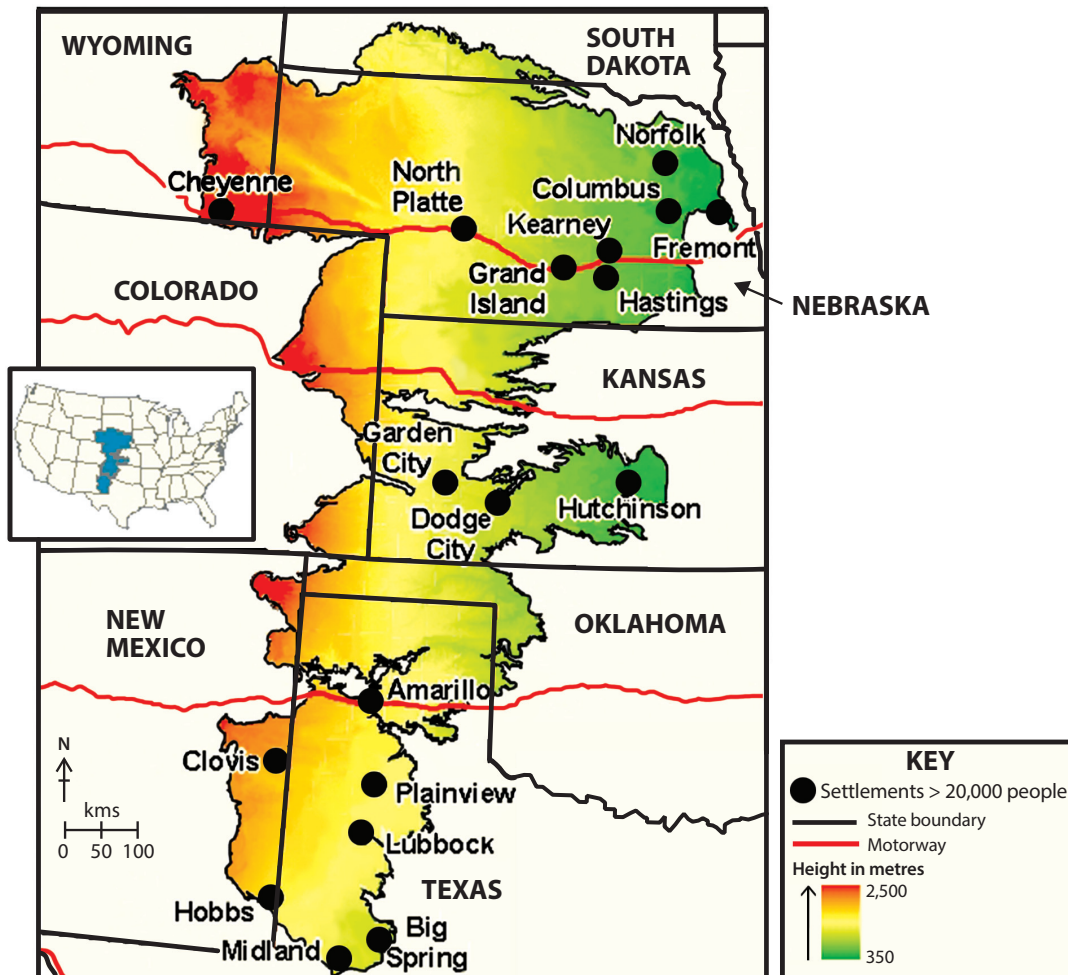
How should the United States government deal with its largest groundwater resource, the Ogallala aquifer?

- One view would be to increase the use of this resource.
- Another view would be to continue to use it at current rates without further development.
- Some people believe that use should be reduced to allow it to recover.

## Information on the problem

### SECTION 1 – An introduction to the Ogallala aquifer

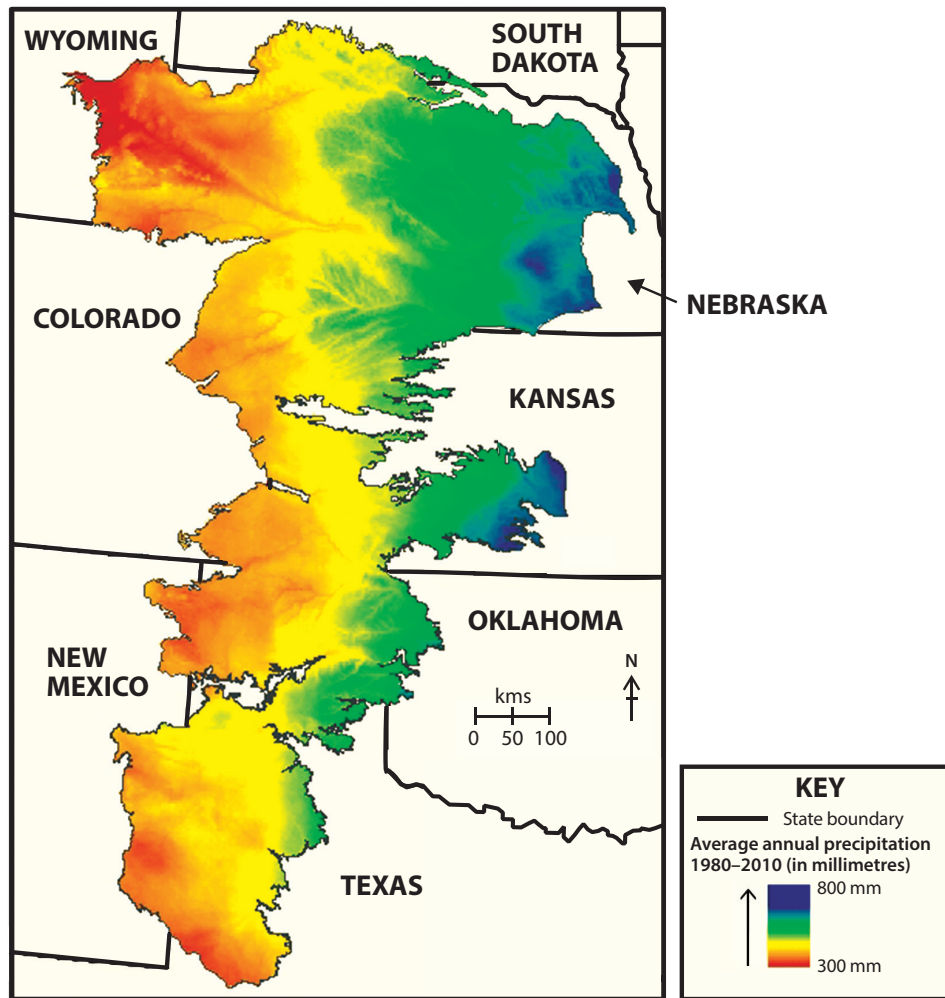
- The Ogallala aquifer is a large area of rock containing groundwater.
- It covers 450,000 km<sup>2</sup> in 8 states of the USA which is less than 1/20th of the land area of the USA but twice the size of the UK.



- At current rates of use the aquifer will disappear this century.
- With no use it would take 600 years to recharge completely.

Figure 1a

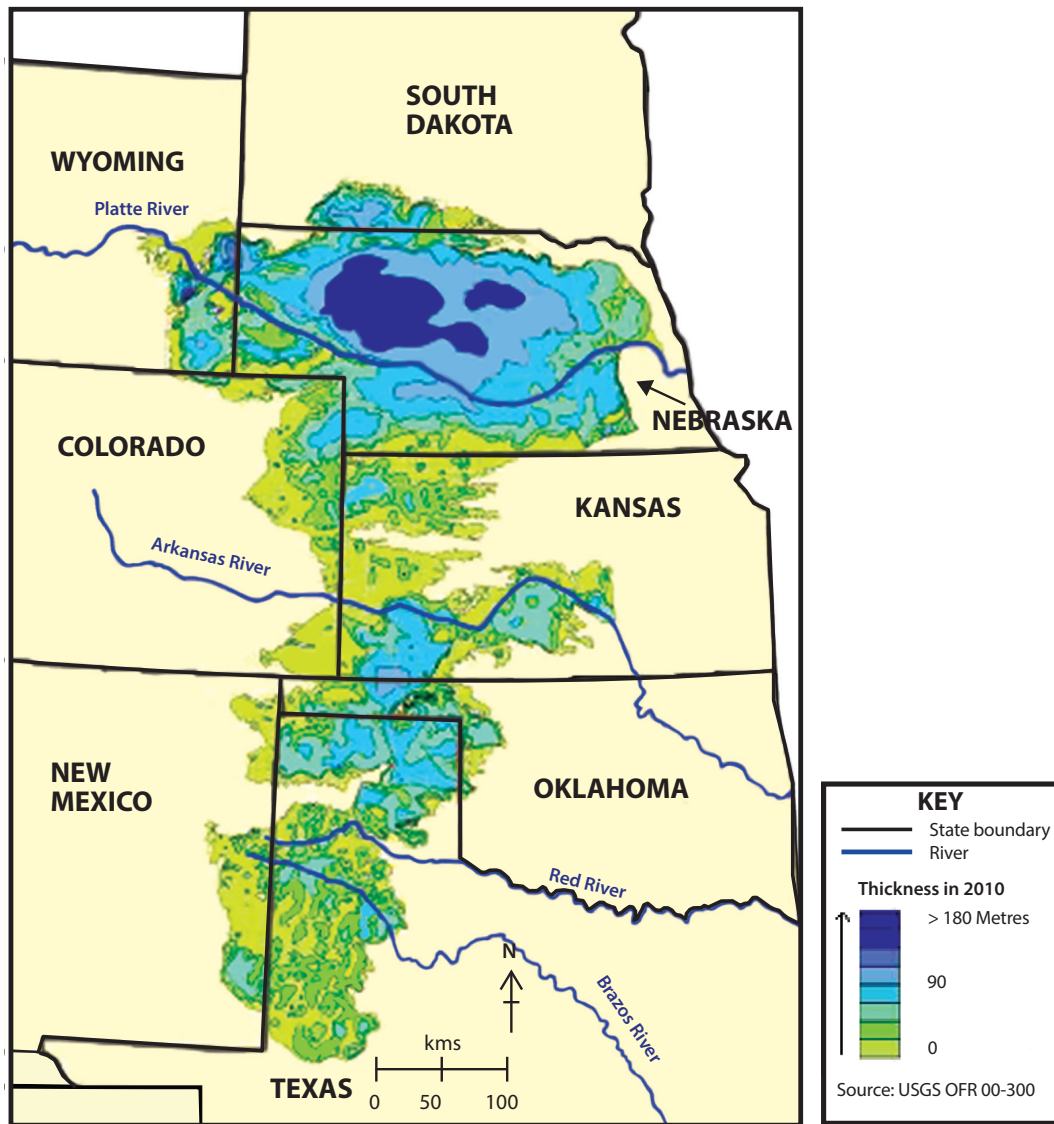
The Ogallala aquifer, its relief and its settlements



- The Rocky Mountains to the west of the aquifer region act as a barrier to weather systems from the Pacific.
- This means that the west of the Ogallala aquifer region is in a rain shadow.
- Future climate change is likely to reduce rainfall but increase temperatures over much of the area.

(Source: © USGS, © NASA Data)

**Figure 1b**  
**Average annual precipitation**



- The top of the aquifer is between 30 and 100 metres below the surface.
- Its thickness varies between a few metres and over 350 metres.
- The water has been there since the last Ice Age when the climate was much wetter than today.

(Source: © USGS)

**Figure 1c**  
**The thickness of the Ogallala aquifer**



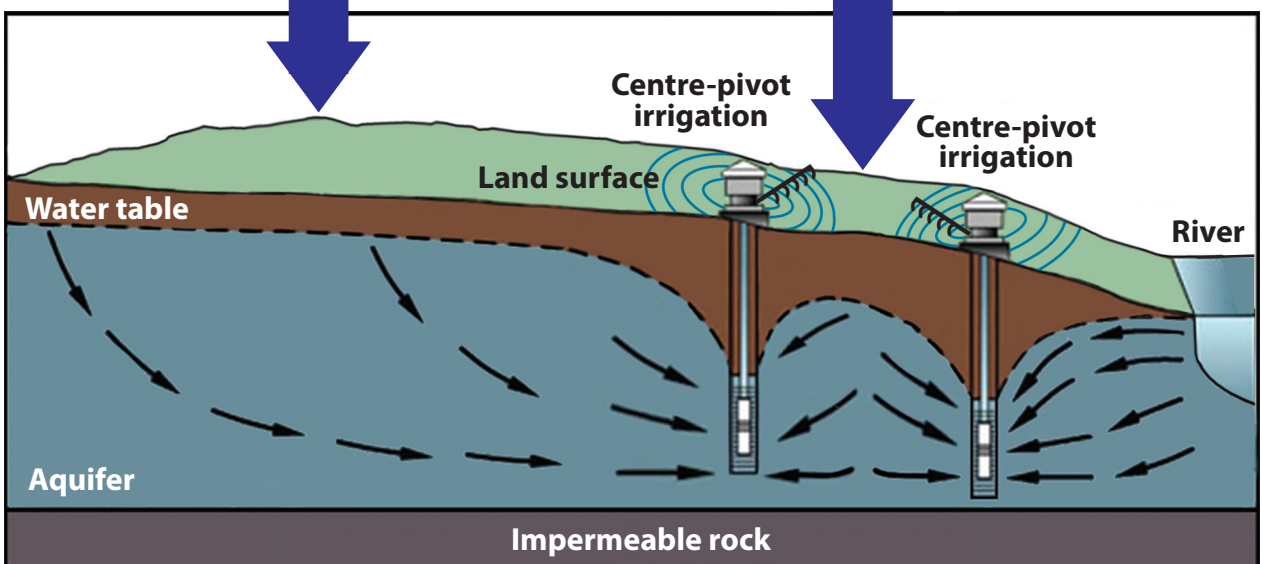
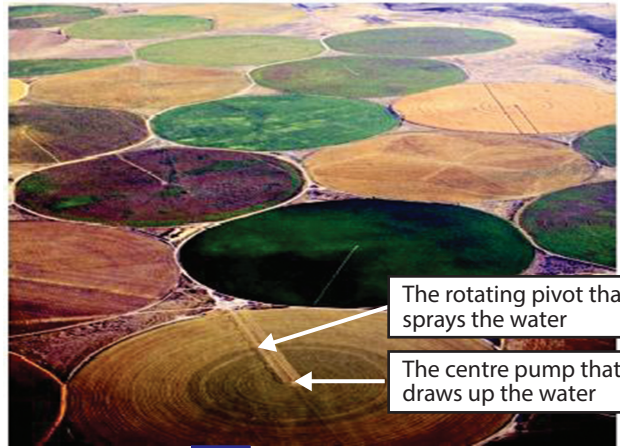
## SECTION 2 – The use of the aquifer

- Most of the towns were founded before the water in the aquifer was available.
- Until the 1960s cattle ranching on natural grasslands was the dominant land use.
- Today, land use is equally divided between ranching and arable farming.
- About 1.9 million people live in the Ogallala aquifer region and depend on its water.
- Income from arable farming is approximately \$20 billion a year.

**Cattle ranching**



**Agriculture**

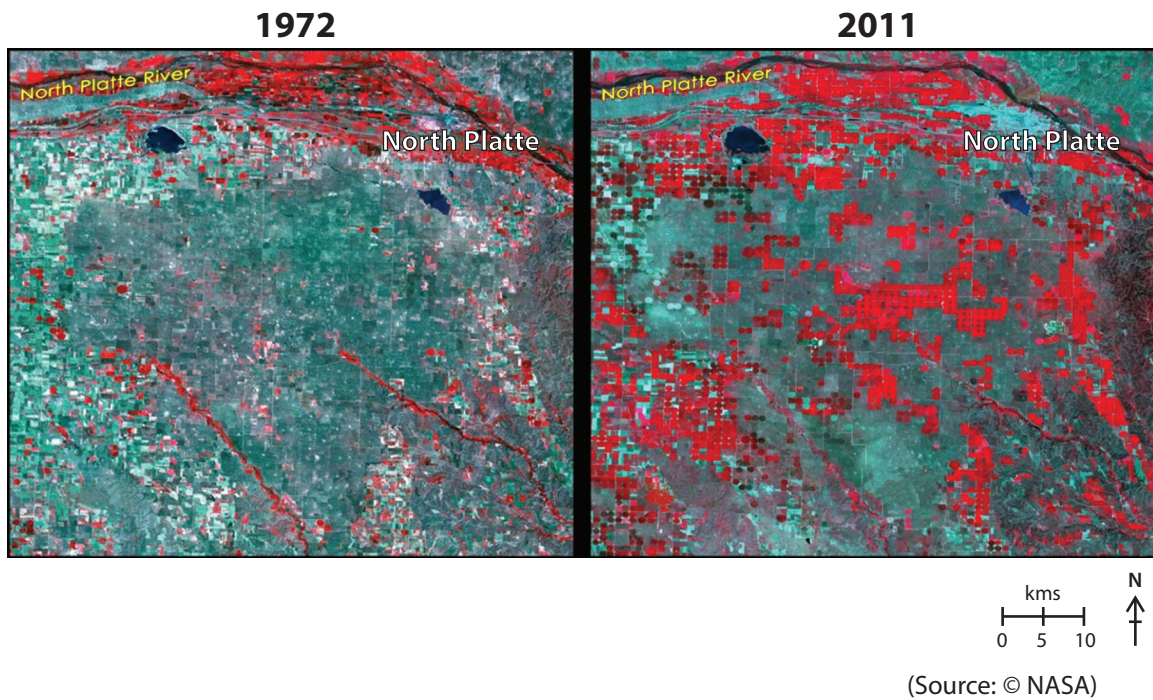


Key: → Direction of water movement

(Source: © US Department of Agriculture)

**Figure 2a**

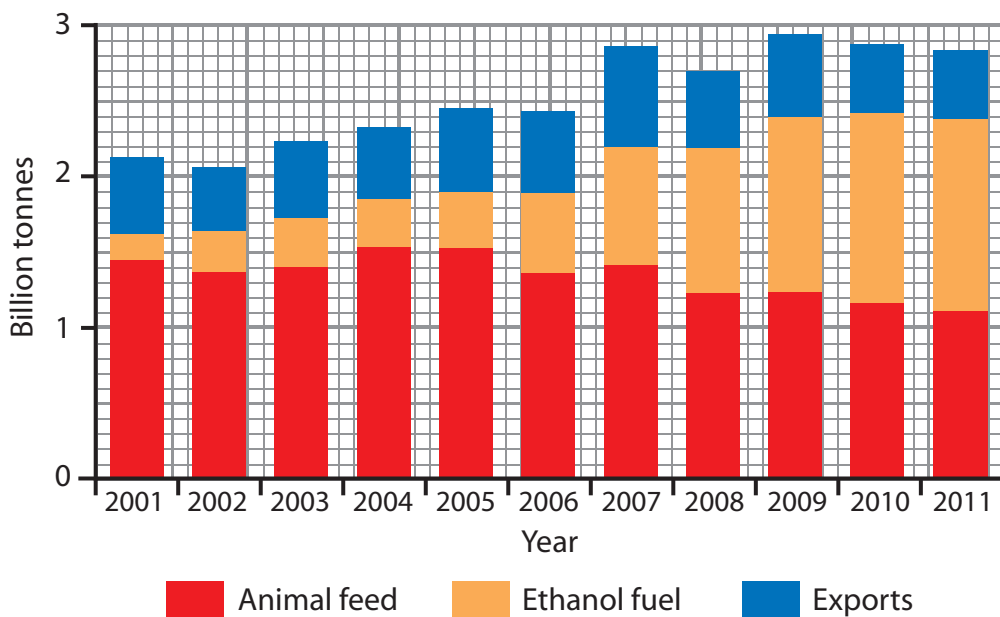
**The impact of centre-pivot irrigation in Nebraska**



**Figure 2b**

**The growth of centre-pivot irrigation in central Nebraska between 1972 and 2011  
(each red dot is one centre-pivot irrigating up to 20 hectares)**

- The US government heavily subsidises much of the agricultural production, especially corn and cotton.
- Some of the crops produced, such as cotton, are exported whilst most of the corn is used as cattle feed or made into ethanol, a biofuel (see Figure 2c).
- Most US beef cattle are raised on intensive 'feedlots' and not on traditional ranches.
- 25 million tonnes of corn would feed 100 million people for a year.



**Figure 2c**

**The changing use of corn, 2001–2011**

<b>Product</b>	<b>Percentage (%) of total USA production</b>
<b>Corn (Maize)</b>	<b>20</b>
<b>Wheat</b>	<b>20</b>
<b>Cotton</b>	<b>19</b>
<b>Beef</b>	<b>18</b>

**Figure 2d**

**The contribution of the Ogallala aquifer region to total US production  
of selected agricultural products**



**Figure 2e**

**An ethanol fuelled 'Hummer', only 2% of cars in the US use ethanol**



**Figure 2f**

**A 'feedlot' raising cattle, which are fed on corn.  
In the USA, people eat about half a pound of meat every day**

### Section 3 – Attitudes of local people to using the Ogallala aquifer

'If the water is there then we should use it – who knows what will happen in the future to solve these problems and who cares. It makes the USA a lot of money, keeps our cars running and puts meat on our plates.'

**Clark** – a shop owner and businessman from Dodge City in Kansas.

'It's a scandal – what we've done to this land. It was so beautiful and we've made it into a vision of hell, just look at the feedlots. We've spoilt the earth for those who follow us. We should stop now.'

**Nancy** – a school teacher and environmentalist from Cheyenne in Wyoming.

'The problem is the big corporations just grabbing the land to make more profits from crops that we don't even use right. Ranchers like me and local people don't benefit at all. In fact both the population and the aquifer is falling because of it.'

**Wayne** – a traditional rancher from North Platte in Nebraska.

'This is God's own country and he will look after us, the Lord will provide. We have to work as hard as we can to make money in this world with whatever we can use – water, oil, any resource. That is our duty.'

**Jolene** – a feedlot worker from Lubbock in Texas.

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